

# COMPUTERWORLD

## THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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## Consumer Complaints Cause Government Activity

### Nixon Advisor Mediates

By Edward J. Bride

CW Staff Writer

WASHINGTON, D.C. — The President's top consumer adviser is investigating frustrations the public often endures in correcting erroneous computerized bills.

Warning that "some tough questions are going to be asked," Mrs. Virginia Knauer criticized "the inability to make one's self heard" while trying to relate a complaint to business "hierarchy."

"Attempting to communicate a problem," Mrs. Knauer said, "the consumer faces a deafening wall of silence, and behind that wall is an army of computers."

Speaking before a college audience in Beaver Falls, Pa., the President's Special Assistant for Consumer Affairs said that she receives over 2,000 letters a month from consumers "in agony" because of problems with businesses.

Many of these, she says, result from the inability to relate product complaints, or billing com-

plaints, to company officials.

Although some corporations have exhibited "a tremendous amount of good will... for the consumer," Mrs. Knauer said that a campaign to improve communications could succeed only if the consumer can "get past that computer."

She added, "we have got to get by the statistical analysis. We simply have to get to the man in charge... and we are going to."

Part of the consumer commitment.

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### Blame the Computer!

MOORESTOWN, N.J. — Invoices from the Merit Cordage Co. here are stamped with the following statement: **YOUR INVOICE HAS BEEN PREPARED BY A COMPUTER. IF THERE ARE ANY MISTAKES, BLAME IT ON THE COMPUTER — NOT US. BUT PLEASE LET US KNOW. SORRY FOR ANY INCONVENIENCE.**

Snapped one receipt, "It seems to me it would at least be courteous to spell computer correctly."

### Gallagher Files Two Bills

WASHINGTON, D.C. — Rep. Cornelius E. Gallagher (D-N.J.) has introduced legislation to protect credit card holders from erroneous billings and, in the process, "transplant a human heart and a human brain" into computer applications.

The chairman of the House Right to Privacy Inquiry introduced two bills to prevent damage to customers' reputations or credit standings while they are attempting to correct accounts which were erroneously reported

delinquent.

Gallagher said his bills would preserve the "privacy and dignity of abused individuals" while promoting the interests of the companies involved by "persuading them to accelerate internal reforms."

The bills were introduced in the House last week, and they deal primarily with legal action involving disputed accounts.

#### End Consumer Liability

The first states that a "willful and persistent refusal" of a creditor to make corrections in the account of a consumer "shall relieve the consumer of liability thereon."

Gallagher commented, "Large credit firms are using computer-generated letters to express concern over customer complaints. These complaints are never acted upon or even acknowledged by people."

"Most often, the first time an individual is aware that he has been unable to reach a responsible person is when he receives a communication from a collection agency, demanding immediate payment of a bill he has been disputing for many months."

#### Reporting Disputed Accounts

The second bill would prohibit creditors from reporting disputed accounts to credit bureaus as delinquent.

Gallagher charged that it is "bad enough when a merchant

(Continued to Page 2)

## Software 'Methods' Patentable, U.S. Patent Appeals Court Rules

By Phyllis Huggins

CW West Coast Bureau

WASHINGTON, D.C. — The Patent Appeals court has just broadened the scope of computer programs that are acceptable for patent grants, according to a recent decision.

Now, patents that describe a method, rather than just a process, can be patented.

The distinction means that programs can be patented by describing the manner in which they make a computer operate, and the effect this had on the hardware.

The decision, handed down by the U.S. Court of Customs and Patent Appeals here, is considered by experts to be a landmark decision in furthering the cause of patent protection for computer programs.

The decision replies to appeal #8216, Serial #243 203, filed by John P. Mahoney.

According to Reed Lawlor, pioneer in the field of computer

patents, "It is the most beautiful decision to come along in a long time. Anyone who makes an advancement in the state of the art through programming inventions will now find it easier to get protection under patent laws."

Significant in the new decision is that such inventions may be protected by "method" claims. Previous decisions have dealt with the mathematics involved in application of use whereas this decision is solely concerned with the manipulation of bits in the computer.

"In general," explained Lawlor, "it opens up the patent protection area so that if a pro-

(Continued to Page 6)

## Army Drops Data Bank But Keeps Bank Data

By Joseph Hanlon

CW Staff Writer

FORT HOLABIRD, Md. — With much fanfare, the U.S. Army has abandoned its computerized data bank on lawful civilian political activity.

But the Army failed to report that a microfilm data bank with a computer-produced index, apparently containing much the same information, is in use in the Pentagon.

Furthermore, only the central data bank has been abandoned. The input has not been destroyed, and could be easily reassembled. Even if the data bank is never reassembled, a soon-to-be-

computerized index would enable the Army to reconstruct parts of the data bank as needed.

The abandoned data bank is the computerized file of Civil Disturbance Incident Reports maintained by the Army Intelligence Command Headquarters here. The incident reports included not only "civil disturbances," but lawful and non-violent meetings and lectures as well. The American Civil Liberties Union and a labor union were included [CW Feb. 11, 25].

#### 'American Citizen Not the Enemy'

Sen. Sam. J. Ervin (D-N.C.), Chairman of the Constitutional Rights Subcommittee, charged the Army with "unjustified interference into domestic political activities." "I suggest that the Army regroup, redefine their strategic objectives, and re-identify the enemy. Under our Constitution, that enemy is not the American citizen," he declared.

In a letter to Ervin and several other congressmen released last week, Army General Counsel Robert E. Jordan admitted that such a data bank existed, and that it had been used to compile "an identification list which in-

(Continued to Page 4)

## Computers at War

## Navy Operations Dependent on DP

By Bernice Pantell

Special to Computerworld

SAIGON — The ship was steaming at 20 knots through heavy seas, her bow heaving and pitching in the oncoming waves. She was holding steady to her course with a cool deliberateness that belied the danger of the bombs and ammo she was carrying.

Alongside, just 20 parallel feet away, an aircraft carrier was taking those bombs on board in a carefully rehearsed and exquisitely timed operation looking to the layman like a scene from a macabre war ballet.

These two ships, the one dwarfed by the other both huge, up-to-date members of the U.S. Navy fleet, are on the firing line on Yankee Station, meaning they are at war in the Gulf of Tonkin, supporting ground activ-

ity in I Corps, the five northernmost provinces of South Vietnam, from the Demilitarized

The story of men at war in Vietnam has been heavily reported, overshadowing the story of the growing role of computers at war.

Computerworld has assigned Bernice Pantell, a free lance writer and DP consultant living in Saigon, to find these computers and report on them.

This is her first story for Computerworld.

Zone down to Quang Ngai Province, 300 miles north of Saigon.

#### 15 Computers

The ships, one a modern supply transport, the other the most modern aircraft carrier on Yankee Station, carry more than 15

computers between them. The Navy has mechanized its tactical, intelligence and administrative functions at sea and is proving the concept for wartime in Vietnam.

Some of the computers are standard business-type configurations, others are specially designed, but all are familiar, stored program, digital data processing equipment.

In the carrier's Combat Intelligence Center (CIC), four CP 642's are used to track enemy targets, get a fix on location, direction and speed, and ultimately launch the weapon to destroy the target.

The program scans multiple targets simultaneously and assigns each a relative degree of threat so that the split-second decisions being made are ordered in the proper priority.

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# DP Alternatives Stressed at AMA

By Drake Lundell

CW New York Bureau

NEW YORK — Facility management and decentralization, as ways to handle data processing needs, came in for heavy discussion at the recent annual EDP conference of the American Management Association.

On one hand, facilities management-the businessman seeks to escape the responsibility of running a DP department, while the second course is aimed at putting the power of the computer directly at the fingertips of using management.

James H. Geer, controller for CBS television network, supports the second approach and feels that the computer should be pulled out of the accounting department and "into the mainstream of our business, run directly by and used by the same people who run our business."

With the computer set aside in a separate department run by computer personnel, Geer said, the using departments lose control of their input data, have no control over the operation of the computer, and are subjected to reams of output that not only were frequently late, but also too voluminous to be used effectively.

To get the computer into the hands of the ultimate user, Geer suggested several steps.

■ The management using the output of the system must be given responsibility for definition and design of the output of the systems from the outset.

■ Initial applications should be in critical action areas of the business and the system should deal with the basic current and

future business data as differentiated from historical, financial, and accounting data.

■ Any information problem must be approached first by a definition of the content, format, and timing of the end-need rather than by a non-selective attack on the mass data available.

■ All data should be entered into the system by the organizational unit having prime responsibility over the function creating the data.

■ Once data is entered into the system all needs for this data within the organization should be identified and these needs should be serviced from one record.

■ All routine reports and intra-department paper flow should be eliminated unless they serve a specific purpose that can be served no other way.

■ All input and output should be in a form and language easily understood by the users.

■ The systems should be directed and supervised by the using departments and personnel manning input-output stations should remain a part of their functional units.

Even though Geer's system calls for more involvement on the part of the ultimate users of the computer-generated information, "Do not think that by this I mean that all the users must become computer experts," he said. They do not have to worry about the "how" of the system,

he said, but they do have to concentrate on what information is needed, when, and in what form.

At CBS, he added, such a system is in operation and "there is no one in the computer room. The system is run completely from remote stations that are located in and run by personnel in the using departments."

## Facilities Management Boosted

Noting that the basic problem with most computer installations is getting and keeping good data processing people, John Hawk, vice-president of International Computer Management, Inc., predicted a sharp rise in the use of outside firms for facility management.

These outside firms can attract and keep people interested by varying their workloads and offering them interesting jobs, he said. They can also supply the expertise needed for the small and medium-sized firm to make the kinds of decisions on equipment and software that are often impossible with in-house personnel.

The normal computer user, he said is interested in results-not technology. By contracting out for data processing services he can specify the results needed and leave the processing of data and selection of equipment to do it in the hands of the facility manager, who takes the risk that

he can perform the job for a set price.

The same type of operation could possibly be handled by a data center approach. Hawk said, but "the ability to share exceptional, skilled personnel among many installations is the most potent attribute of facility management and the one which gives it an edge over the data center approach."

In the future, Hawk sees outside firms offering a complete service from running the computers to providing for all the data needed and suggests that such services would be known as "data management" firms.

"Some companies have already discussed the possibility that the entire controllership function could be handled by management contract," he said. "Why not enlarge the function to include all data of an organization—both manually processed and automatically processed data—and let the data management company run the whole show?"

Both presentations indicate that management is looking for ways to better control its data processing department and the costs of data processing. By bringing the DP function more under the direct control of the line management in a company, as Geers suggests, places the responsibility of data processing directly into the mainstream of a firm's business.

## President's Advisor Mediates

(Continued from Page 1)

tee's campaign will be a study of "effective complaint handling systems," used by large companies, she said.

She cited some corporations which provide Watts telephone (toll free) access to high officials, so consumers can register complaints on a personal and immediate basis.

She also mentioned a company whose board chairman receives copies of all complaint letters, thus intimidating juniors in the executive chain to "hop to, because the chairman of the board may pick up that phone and ask

about that letter."

She says these are good systems, and adds that her committee wants to know "what other good systems there are."

The result hopefully will be the avoidance of such instances as reported by a housewife: "It took me six months before I could get a human to look at my problem."

A spokesman for Mrs. Knauer said that complaints about computer-generated letters, and consumer frustrations in correcting billing errors, were a "major" problem since she took office

last April.

The spokesman indicated that the subject of many of these letters was a large credit card company that uses computers for both accounting and "communicating" with customers.

## Gallagher Files 2 Consumer Bills

(Continued from Page 1)

will vindictively damage the credit rating of a customer who complains; it is impermissible for credit ratings to be routinely damaged because of the failure of internal procedures in large credit card companies."

Concerned over computer applications since 1966, Gallagher initiated congressional consideration of the credit bureau industry in March of 1968.

He charges that "some completely automated firms are deliberately trying to destroy the future of the computer." He adds that his new bills will "permit the computer to be used for its many valuable functions, without being fatally tarnished by current practices."

Gallagher said he has received thousands of complaints about computer-generated letters and erroneous billings.

He said that eliminating consumer liability when the company is at fault, and protecting customer records which are involved in disputes, would put a "human heart and a human brain" into computer applications.

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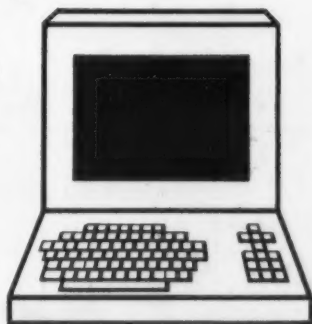
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# Honeywell Adds Six Disk Drives to 200 Series Line

WELLESLEY HILLS, Mass. — Honeywell has added six random-access disk drive devices designed for users with medium-to-large mass storage requirements.

Five of the units are versions of the Honeywell Type 278 multiple-spindle disk drive. These units accept a 20-surface, double density disk pack. Similar to the IBM 1316 pack, used with the 2311 drive, that stores 35-million characters.

The sixth unit, Type 172, accepts 10-surface, single density disk packs, similar to the IBM 2311 pack, used with the 2310 drive that stores 9.2-million characters.

The Type 278 drives are now available in storage capacities, for use with medium and large

Honeywell Series 200 computer systems, according to Harry E. DeSmet, group product manager of peripherals.

Storage capacities of the larger type 278 drives range from 175-million characters on the Type 278-5 five-spindle unit to 280-million characters on the Type 278-8 eight-spindle and Type 278-9 nine-spindle units. Because of their modular design, Type 278 units may be expanded in storage increments of 35-million characters (one spindle). The Type 278-9 provides the user with one spare spindle.

Common characteristics of the new drive units include according to Honeywell, the first electronically-controlled read/write head positioning mechanism involving a linear trans-

ducer and electronic servo mechanism; a slider bearing design for the read/write heads; an electronic non-contact braking unit and the use of monolithic integrated circuits throughout.

The read/write head positioner is said to provide faster, more accurate positioning of the read/write heads over the data tracks on the rotating disk pack than other available electro-mechanical or hydraulic positioners.

Operating characteristics of all Type 178 disk drives are the same. Spindles rotate at 2,400 rpm for a 12.5 msec average latency time.

Average seek time on the Honeywell disk units is 50 msec as compared with 75 msec for the IBM 2311 and 60 msec for

the IBM 2314 drives.

With the 278 series, information is transferred at the rate of 416,667 six-bit characters per second, and the drives may be used on any of the following Series 200 central processors: Model 1200, 1250, 2200, 3200, 4200 and dual-processor 8200, Honeywell says.

Delivery of the Type 278 multiple-spindle units will begin in the fourth quarter of 1970. The type 257-3 control unit, which is built into each drive unit, will lease for \$1,345 per month on a five-year contract to \$1,500 per month on a short-term contract, or may be purchased for \$61,110.

Lease prices for the five Type 287 drives range from \$2,420/mo for the five-spindle

drive with 175 million characters of storage, to \$4,290/mo for the nine-spindle model with 280-million character capacity. Purchase prices vary from \$98,490 to \$174,510.

The Type 172 disk drive is designed for exclusive use on the Model 115 central processor in the Series 200 family. The unit uses 10-surface, single-density disk packs for storage of 9.2 million characters.

The Type 172 drive spindle rotates at 2,400 rpm for an average latency time of 12.5 msec. Average seek time is 50 msec. Data is transferred at the rate of 208,333 six-bit characters per second, Honeywell says.

Deliveries of the Type 172 disk drive will begin in June.

## Army Abandons Civil Disturbance Data Bank But Keeps Data

(Continued from Page 1)

cluded the names and descriptions of individuals who might be involved in civil disturbance situations."

Jordan said that the Army has ordered the destruction of all copies of the identification list, and that the use of "the civil disturbance data bank was discontinued since, after study, it was determined that the data bank was not required to support potential Army civil disturbance missions."

An Army spokesman said that use of the data bank was stopped Feb. 18. He also said that IBM 1401 used for the data bank had also been used for payroll and other command functions, and would continue to be used in those areas.

### Input Not Destroyed

The spokesman was unable to say whether the data bank tapes had been erased, or if they had merely been placed in storage. Furthermore, he admitted that copies of the input to the data bank have not been destroyed, and that the status of these copies "is being reviewed."

Under the old procedure, 1,000 military field agents, as part of their job, collected newspaper clippings, police reports, and other information on "civil disturbances." These reports were sent to the seven Military Intelligence (MI) group headquarters, who forwarded them here to Fort Holabird for inclu-

sion in the data bank.

Under the new procedure, the field agents still collect the same information and forward it to the seven headquarters, as before. Now, however, the headquarters keep the information and do not forward it to the central data bank.

Furthermore, the MI headquarters still have copies of everything which they sent to Fort Holabird. The Army spokesman admitted that the only real change in procedure under the new ruling is the elimination of the central data bank. A non-computerized version of the data bank exists, although dispersed to seven locations, and collection of information continues.

### "Computer-Aided"

Jordan concluded his letter with the statement: "No computerized data bank of civil disturbance information is [now] being maintained." But that statement is correct only if one distinguishes between computerized and computer-aided. At least one computer-aided data bank of civilian disturbance information is still being used.

That data bank is maintained by the domestic intelligence section of the Counterintelligence Analysis Division (Ciad) of the Office of the Assistant Chief of Staff for Intelligence. An Army spokesman admitted that such a data bank existed, but refused any other comment.

Other sources report that the Ciad data bank is in the domestic war room of the Pentagon.

### Computerized Master Index

In his letter to the congressmen, Jordan reported the existence of a master index of the names of everyone ever investigated by a defense agency. Called the Defense Index of Investigations, it was established at Fort Holabird in 1965 and is presently being computerized.

"Data included in this index is limited only to the identification of an individual, the type of investigation conducted, date of completion, and the location of the investigation (for example, Army investigations are filed in the Investigative Records Repository). The data is placed on keypunched cards which must be alphabetically filed," Jordan said. Unofficial sources report that there are now over 18 million cards.

When the computer is installed, according to Jordan, information on these cards will be entered into the computer. "The purpose of this computer will be to rapidly identify and indicate the location of files needed in security investigations."

Army and Defense Department spokesmen declined to amplify on Jordan's statement. But other sources said that the index prob-

ably contained references to persons mentioned in the Civil Disturbance Incident Reports as well as those included in the Ciad data bank. If this is true, then the Army could easily recompile the data on anyone who had a listing in the civil disturbance incident report data bank. This could be done by checking the index for the name; if the index indicated a listing in the now abandoned data bank, the intelligence officer would only need to contact the seven MI offices to recompile the file.

### Other Army Files

The Army does not just investigate political activists. In fact, most of its investigations are in other areas. In his letter, Jordan noted: "The U.S. Army Investigative Records Repository, run by the Intelligence Command, has approximately 7 million files relating principally to security, loyalty, or criminal investigations of former and present members of the Army, civilian employees and contractor personnel."

Unofficial sources report that "contractor personnel" goes as far afield as employees of the Red Cross. Furthermore, they say that the Investigative Records Repository also contains information on aliens, in-

cluding prospective spouses of Army personnel and aliens investigated because of complaints.

In all, ten Defense Department Agencies maintain data banks of investigative records. These agencies include the Navy, Air Force, Defense Atomic Support Agency, and the Defense Supply Agency.

A data bank is even maintained on newspaper reporters accredited to the Pentagon, and includes comments on "inaccurate reporting."

Access to files, according to Jordan, "is limited by regulation to specifically authorized Executive Branch agencies."

### Ervin Critical

Sen. Ervin has been particularly critical of the Army's collection of data on civilians, calling it "a case of military overkill." He continued: "Regardless of the imaginary military objective, the chief casualty of this overkill is the Constitution of the United States."

### Calls For New Agency

Sen. Ervin concluded that Jordan's letter "provides a remarkable demonstration of the need not only for new laws but for a new agency to regulate data banks and protect individual privacy."



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# LA Says Votomatic OK, With New Precautions

By Edward J. Bride  
CW Staff Writer

LOS ANGELES — The Los Angeles County Election Security Committee has wound up its hearings on the security of IBM's computerized vote count system [CW, Nov. 19, 1969], by recommending that the system be kept, but specific measures be taken to protect election results from fraud or error.

A chief antagonist of the system, James Farmer of Systems Research, Inc., has agreed that the recommendations are "reasonable" if precautions recommended by several witnesses are indeed adopted.

Farmer said that the committee's recommendations were stronger than he had anticipated, and that the system—called Votomatic—would be secure, and would always provide more accurate and more timely voting information than any other system currently available, when

the precautions are implemented.

Farmer was on a team of programmers who "rigged" elections in a "war game" environment last summer. This drew much attention to charges of Votomatic's vulnerability to tampering [CW, July 23, 1969].

He now says that most of the vulnerability has been eliminated, but that there will still be a great deal of trust in the honesty of election workers.

The report makes several recommendations to remedy criticisms of the system, including random sample recounts of ballots, and observer teams at all critical phases of the vote count process.

Other recommendations include tight overall security of the operating system, auditing the vote tally program to reduce program error or fraud, and other measures that could apply to any type of vote count process.

Farmer said that a reliable method of

auditing the vote tally program has yet to be devised, and that this technical problem needs continued attention.

The committee submitted its finalized report to the county Board of Supervisors last week, culminating almost six months of hearings. The findings were:

- No evidence came to the attention of the committee to indicate that fraud had been "attempted or perpetrated."

- Qualified experts testified that while computer rigging is "technically possible," the chances of it are "extremely remote." Additional safeguards can be taken; fraud by computer rigging would not be possible without collusion.

- Technicians and experts who conducted the "vote rigging games" indicated to the committee that they had "relatively little rather than full" knowledge of the complexity of the county's voting system.

- Evidence was presented that it would

be exceedingly difficult if not impossible to counterfeit or substitute ballot cards, although there was no evidence presented to indicate that the system itself would detect such a practice.

## 'Methods' Patentable

(Continued from Page 1)

gram does involve invention and is properly worded, and is claimed in such a manner that the method cannot be practiced with just the brain or pencil and paper, then it won't be rejected as improper. It will be recognized as a mechanical or electrical process as distinguished from a mental process."

"Remember," Lawlor emphasized, "In this case we are not talking about the application of the computer, but about how it is going to operate all the time it is on."

"A process that cannot be carried out in the mind alone but requires a machine, is now patentable. This is not new in other fields. But it has not been recognized in the computer programming field until now. Now that this question has been settled, just watch, in the near future, many of the applications filed years ago will mature into patents."

The Mahoney matter was first filed Dec. 5, 1962 as a "synchronizing circuit and synchronizing technique." It relates to data communication systems and more particularly to circuits and methods for automatically synchronizing a receiver of digital information such as a computer. The method is described broadly in the following claim which the court of appeals has now said is allowable.

The method of establishing which bits in a stream are data bits and which are framing bits, where the framing bits appear in predetermined positions and have a predetermined sequence of values, comprising the steps of:

- 1) Comparing to one another the values of bits in respective bit positions in successive equal length groups of bits.

- 2) Registering which respective positions in said groups of bits have a sequence of bit values inconsistent with said predetermined framing sequence as ascertained by repetitions of the comparing step, and

- 3) Counting the number of successive bit positions in the bit stream wherein the sequence of bit values has been ascertained as inconsistent with the predetermined framing sequence. Whereby the framing bit positions are established when the number of successive bit positions counted is equal to the total number between the framing bit positions.

In finding the claims allowable the court relied upon definitions in technical dictionaries about the meaning of the word "bit" and "bit stream" rather than following the customary pattern of using standard laymen dictionaries which misconstrue technical meanings.

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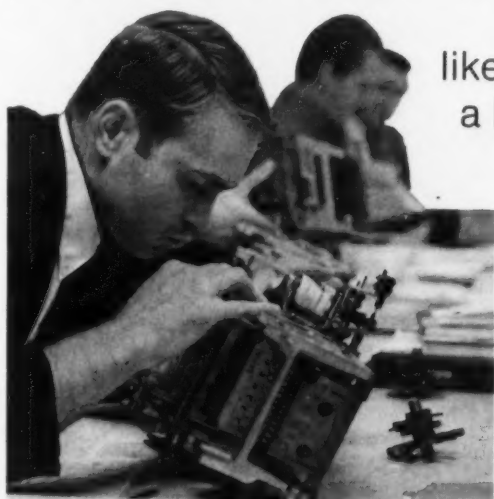
In the salons of technology they twitter about the new computers, and sometimes we do, too. But all those workaday calculating tasks keep piling up, problems in search of an economical solution. That's why all those punched card machines are still around. Along with all those well trained men to care for them. You need good men in a vanishing business.



The unit record business is disappearing so fast it takes a service force of almost 1,000 men to keep our customers happy. There are over 6,000 customer installations, many of which run their punched card equipment day and night.

Here we are in this so-called defunct business and still we're working nights and weekends keeping up with the workload. The only thing that's vanished is the eight-hour day.

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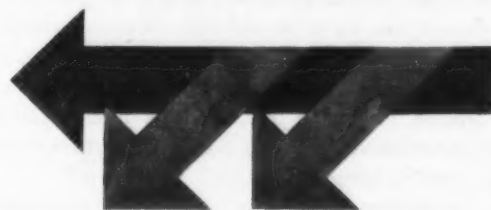
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## Editorials

### Year of the Tiger

Public discontent over the way people have been treated by computers, especially computerized billing systems, has now reached the point where the President's consumer protection staff is stepping into the picture.

The warnings have been clear. In 1969 even some members of the computer community were recommending that people mutilate punched card bills as the most effective way of fighting back.

But the personnel of many data centers maintain a cool detachment from the real world which can only be described as arrogance by the public.

Even if they weren't so well paid, DP people would still have a moral obligation to use their power wisely. The fact that they are so well paid leaves no excuse whatever.

Trouble for the public begins in three areas: bad implementation scheduling, inadequate systems analysis, and careless computer runs.

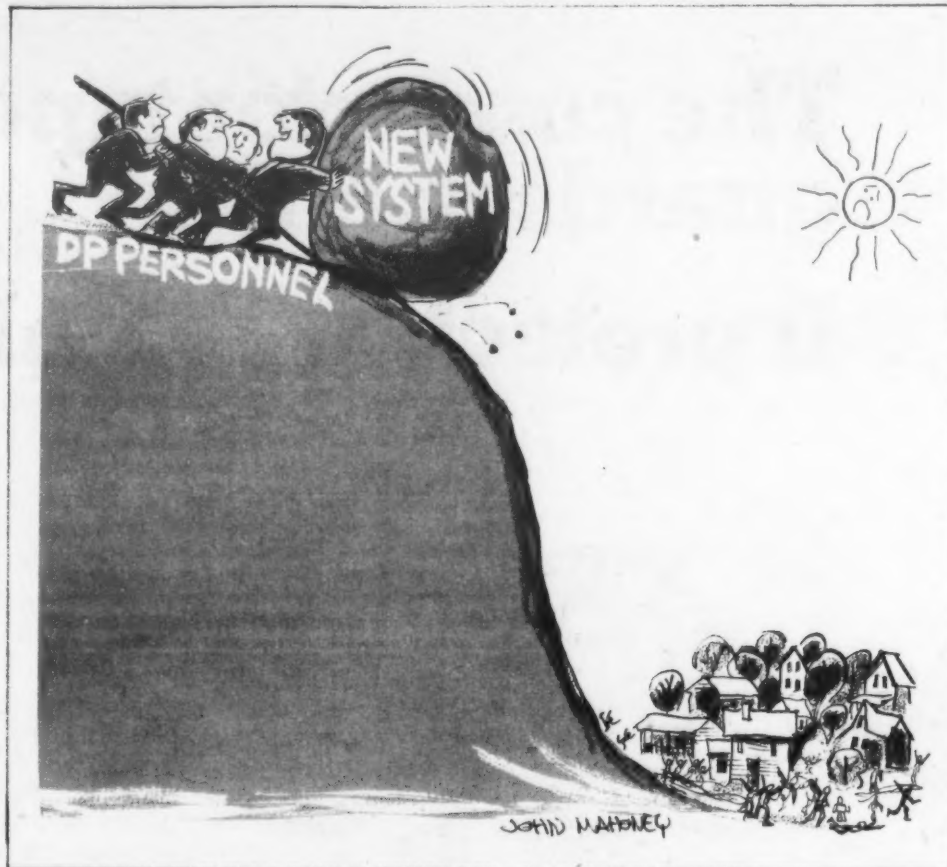
The implementation of a system should be scheduled in such a way that the public is not inconvenienced. Parallel runs are expensive, but they represent a necessary safeguard. What right, for instance, do DP people have to withhold checks from the public for up to a month just because of poor planning?

The analysis of a new system should make allowances for every possible situation to be handled in such a way as to avoid inconveniencing the public. Then, since something always happens that no one anticipated, there should be a routine to handle exceptions not handled by the exception routines. No system should be designed in such a way as to permit the computer, without human intervention, to send out a series of dunning notices or to order specific action taken against a person.

Carelessness in making runs and in checking the results is probably the most unforgivable sin of all. Everyone around a DP installation knows — or certainly should know — that a "minor" mistake can raise hidden havoc in a system. Yet many installations apparently don't take even elementary precautions. To name three disasters: wrong information punched into a control card, an untested new compiler used in a "compile and go" run, a tape-to-print run made on the wrong computer. In each case, the program ran, but the output contained major errors not detected by installation personnel.

By last year, the public had had enough. Suits were brought, bills were introduced into various legislatures, and, as mentioned above, even DP people began to retaliate.

Unless we mend our ways, 1970 could be the year that the public turned into a tiger and pounced on us.



*Just Doing Our Job, Right?*

## Letters to the Editor

### Question of Credentials Not Always Relevant

By Mr. Chaffin's reasoning, it is the 'right of the owner or lessee'... of a hydrogen bomb to determine when to drop it, of a stream to decide whether to pollute it. I object most strenuously. There are certain things which belong equally to all of us, among them being the natural environment, including the atmosphere — and personal privacy. I claim full right to partake in any decisions on these matters — the question of credentials is not relevant!

Irv Thomas  
Programmer

Seattle, Wash.

### MAI Is Not Only Outlet For Photon 7700 Printer

Thank you for the picture and caption on Photon's 7700 Typographic Peripheral Printer [CW, Feb. 11].

But the units scheduled for initial delivery by the middle of 1970 are known as "Photon 7700 Typographic Peripheral Printer" and not "MAI - Photon." The 7700 is being marketed and serviced by MAI on a nonexclusive basis. Photon is planning on marketing the 7700 through its own and other sales organizations in addition to MAI.

Theodore Magida  
General Manager

Computer Graphics Division  
Photon, Inc.  
Wilmington, Mass.

### Poor Survey Design Is Seen Leading to Misinterpretation

I am concerned that poor survey design and possible misinterpretation by Joseph M. Surkis are involved when he implies [CW, Feb. 11] that noncollege programmers show better job loyalty than degreed programmers. I doubt that the proper parameters are being used when investigating job turnover as a function of education. Is the more educated college graduate less loyal — or is he perhaps more mobile in response to the larger demand for his services? Extrapolation of the study done by Surkis indicates that exhaustive study would perhaps have shown that employees

without a high school education could have been shown to be the most loyal of all.

Fred H. Harris  
Director

The University of Chicago  
Computation Center

### Computers Are Not Idols

Auerbach [CW, Feb. 18] could easily be the No. 1 idolater when it comes to computer hardware. This is not remarkable when one considers that Auerbach earns his bread thereby.

What is remarkable is the view of the past and of the future which he offers. Seldom have I seen a "glass-walled showcase"; often do I view the grubby basement as a home for the machinery. The data processing executive lucky enough to get the machine out into the unobstructed view of management has indeed been fortunate. The motive for display has been involvement, not mechanical Bar-Mitzvah.

Perhaps idolatry is not the correct word to describe that "event" in which there is not "very close and frequent physical and mental contact between the user and the programmer." Unless the problem is trivial or the user is an idiot, what sort of programmer can elicit design concepts from the user without the user's involvement? A "god" programmer? Isn't this the concept that has indeed driven costs up?

It is easy for me to dream of that time when there will be no distinction between the user, the designer, and the "programmer" of the applications program. For when that time comes, all of these things will be subsumed under a common term, perhaps even "human being." Auerbach needs to reread Wiener's *Human Use of Human Beings*.

F. Parker Fowler, Jr.  
Systems Coordinator

Colorado Commission on Higher Education  
Denver, Colo.

Computerworld welcomes comments from its readers. Preference will be given to letters of 250 words or less. Computerworld reserves the right to edit letters for purposes of clarity and brevity. Letters should be addressed to: Editor, Computerworld, 797 Washington Street, Newton, Mass. 02160.



# Good Advice-Will ACM Take It?

In the February issue of *Communications of the ACM* Walter Carlson, ACM vice-president, asks people to "get busy" on deciding what standard they have. In the course of the article he points out that the interests of the particular person involved as opposed to the interest of the general public creates a number of special interests. Carlson lists some of these. He points out that each manufacturer wants to preserve uniqueness and exclusivity to gain rewards of a "special" position in the market place.

By contrast he points out that each user wants to have a wide choice among standard, compatible options to increase competitive pressures and to reduce costs, while obtaining no loss of efficiency. He also says that each professional wants freedom to explore innovative solutions to his tasks without being forced to use standards that are based upon what he considers adolescent technology, and that each manager wants to reduce or eliminate risk of unnecessary experimentation when tried and permanent approaches are available.

## New ACM Regime

Carlson acknowledges that these interests are in conflict and that therefore no single authority can dictate the answers. He goes on to talk about the current ACM activity in the standard's field. Previously the ACM vote on standards was made almost at the whim of a single individual, and without checking the membership's wishes. A new regime has now come in, and the many ACM special interest groups and committees are all being asked to consider standards.

## Conflicts Will Still Arise

Unfortunately within this new regime there is still the possibility of conflicts of interests arising. The special interest groups include a wide variety

they were under the previous one.

## What Are ACM's Interests?

If ACM took Carlson's advice and decided what its own standards were, it could do a great deal for standards. Currently we do not know if ACM is representing the manufacturers. This is a very real possibility. ACM's corporate membership includes practically all of them.

Or does ACM represent the researcher? Another very good possibility. The university bias in the selection of council members has been noticeable and commented on for years. Perhaps ACM represents the users. Some of the special interest groups and committees may do so. However, the

## The Taylor Report by Alan Taylor



indications of any active real representation of users in the ACM standards effort are still lacking as far as I can see.

Until we know — and ACM knows — who it represents, and until a single as opposed to a multiplicity of conflicting ideas can be given, the role of ACM in standards will be a wishy-washy one, subject to log-rolling, politics, and all

the nastinesses associated with these. As such they cannot be surprised if 90% of their readers tune out at the mention of standards. (This is Carlson's estimate, not mine). Nor can they be surprised if ACM standards activity is pretty low.

Good advice, Mr. Carlson — but will ACM take it?

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## SicEval Calls for Help

SicEval (the Special Interest Committee for System Evaluation) is an interesting group. It was formed some nine or ten months ago mainly by Saul Stimler, who is known for his authorship of one of the very few books on how to evaluate system performance.\*

SicEval deals with such "hot" items as how to measure the cost of a computer system. Performance in its opinion obviously deals with both the work being done, and the cost of having it done. Needless to say in the past the real cost of computers has often been hidden and underestimated. SicEval is one of the few possible sources that might bring to light some of the true facts and figures regarding computer costs.

Unfortunately SicEval now needs help. Saul Stimler is no longer being backed by the resources of a major manufacturer. Questions have arisen as to whether or not the information it produces can really be reduced to writing and whether or not only the people in the Delaware Valley can profit from it. In short the whole show is up for reconsideration, and may soon be greatly curtailed.

By the time that you read these words, that reconsideration may or may not be over. The critical meeting is in Philadelphia and naturally I will be there to try to see that the valuable information that SicEval can produce is given the widest coverage. Hopefully we will be able to prevent the threatened curtailment, but in any case I will let you know what happens.

\*Real-Time Data Processing Systems: A Methodology for Design and Cost/Performance Analysis. McGraw-Hill, \$13.50.

of disciplines like the university researcher, the computer manufacturer, the user, and the EDP manager. From these groups will come opinions like one from a university researcher, who told me (in regards to the PL/1 standard,) he couldn't care less whether or not the language changed every year. "I can easily teach the new one to the new set of students," he said. These groups contain representatives of computer manufacturers, who are constrained to follow and attempt to optimize the manufacturers' interests. To some extent the groups also contain genuine users — but the users are generally busy getting the work done, instead of worrying about standards. In short, even under the new ACM standards regime, the various problems that Carlson notes are as much in evidence as

## Letters to the Editor

### Burroughs Operating System Was Overlooked

A statement in the software section of your Jan. 28 issue is completely out of character. On page 37 under the heading "Operating Systems a Benefit to User," your writer implies that IBM and Honeywell have the only significant operating systems. Burroughs Corp. should sue you for libel. They not only were one of the pioneers in Op systems, but as almost every independent expert will testify, have far and away the best Op system available in their 2500, 3500, and 6500 series. As for language trends covered in the same article, the 5500 does not have, nor has it ever had, an assembler level language. I think you will also find that no manufacturer offers an easier to use or more efficient Gobol than does Burroughs.

Having worked closely with IBM, Honeywell, and Burroughs equipment for ten years, I can agree with your comments on the first two, but please apologize to Burroughs. They get ignored by the press too much as it is.

Norwood Jones  
Data Processing Officer

First National Bank  
El Dorado, Ark.

There was no intent to slight the Burroughs software. *Computerworld* has made many references to the high quality and excellent scope of capabilities of such systems as MCP. The absence of a Burroughs reference was purely an oversight. You are also correct in pointing out the absence of any form of assembler language on the Burroughs systems. The use of a form of Polish Notation in place of a digital machine language greatly enhances the use of the machine for software design, and the resulting applications programming. Ed.

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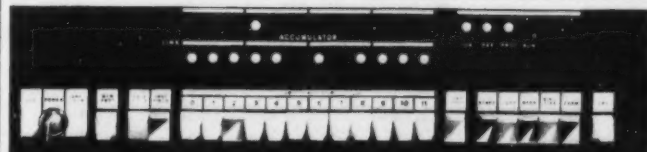
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## Dating Service's Records Subpoenaed to Determine Computer Use

NEW YORK — The books and records of a computer dating service here were subpoenaed when numerous complaints reached the attorney general's office and the consumer fraud bureau.

The latest in a rash of complaints against such services came to light when the company moved in Supreme Court to quash some of the demands made in the subpoena.

The Los Angeles-based company, International Compatibility Inc., says it has more than 100,000 clients in the New York

area.

The New York attorney general's office has also subpoenaed the records of the Matchmakers computer dating service. This company is already under investigation in California [CW, Feb. 25].

### Two Plans

International Compatibility offers its customers two plans, one costing \$495 and the other \$395, to be paid over a period of five years with a certain number of dates guaranteed each year.

For this money, the service

offers computer-based pairings based on the compatibility of their clients.

But complaints to the consumer fraud bureau revealed that most of their selections were based on incompatibility. In areas such as age, height, religion, interests, and hobbies among other, individuals found that their dates had exactly the opposite traits to those requested.

In other cases, clients complained that they had received far fewer dates than they had been promised.

The company's basic approach is to work on a client's loneliness, according to a spokesman for the attorney general's offices.

The service claims that all the information it gathers from "psychological and intelligence" tests and personal data forms from individuals is fed into a computer to ensure scientific selection.

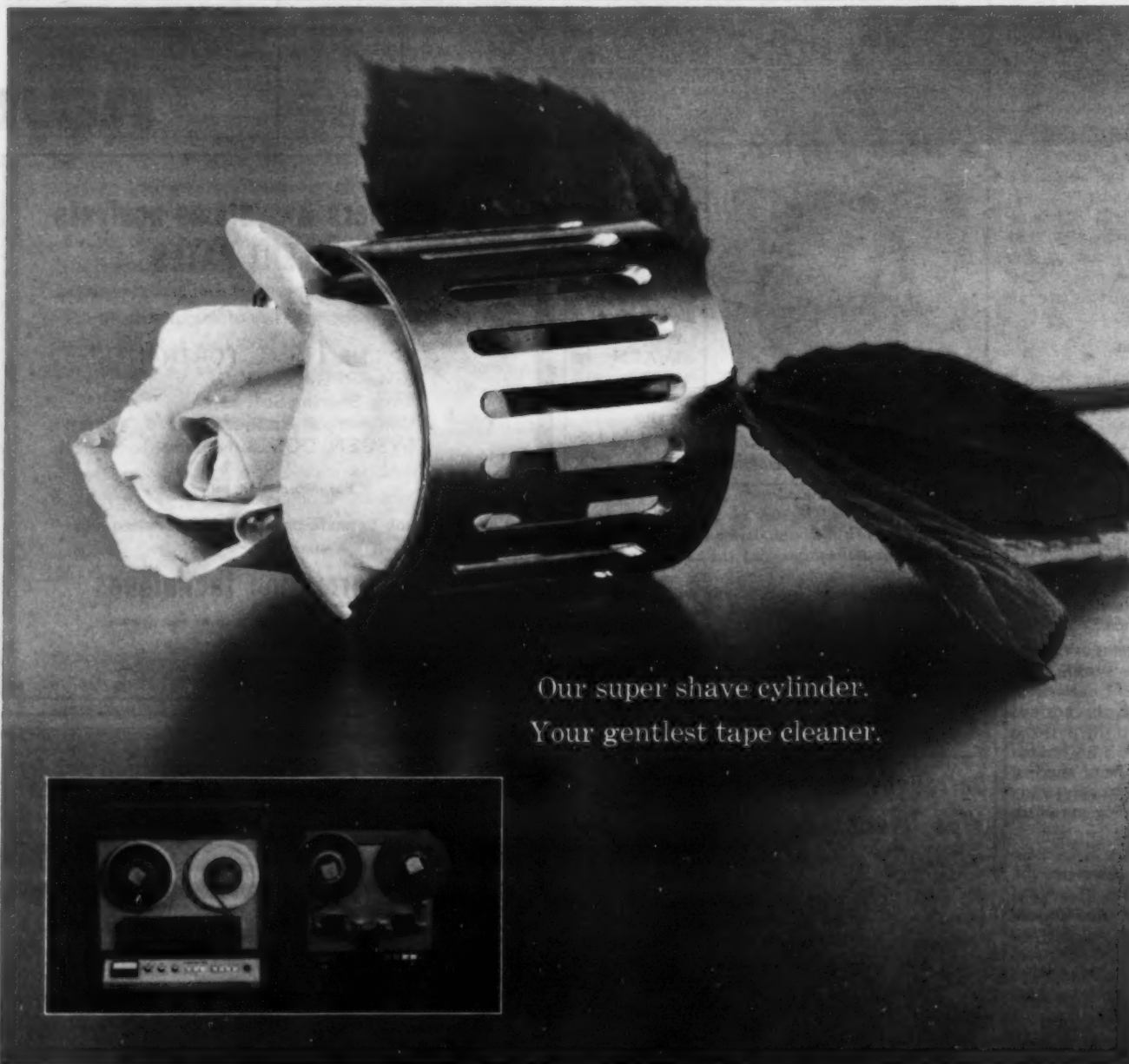
The firm's records were subpoenaed in an effort to find out how, or if, a computer was actually used to match the com-

pany's clients.

In addition, the company's advertisements may well be misleading and false, according to the spokesman.

International Compatibility has balked at turning over its records to the attorney general's office claiming that it would be an invasion of privacy. It also declines to turn over its computer records, claiming that they are a "trade secret."

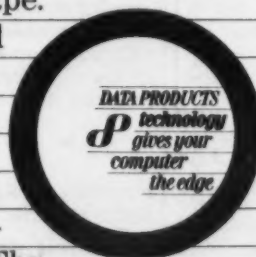
A ruling on the company's appeal is expected shortly, according to the attorney general's spokesman.



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## Univac Increases Prices for 9200 And 9300 by 5%

PHILADELPHIA — Univac has revealed price increases went into effect last month and at the first of the year.

A 5% increase for purchase, rental, and maintenance on the company's 9200- and 9300-series of computers was announced for February, with "selected peripherals" excluded from the hike.

A 5% rise in rental price had been announced earlier for the 1700 series of verifying keypunches and verifying-interpreting keypunches.

Univac did not unbundle its prices with several other manufacturers, and last fall announced intentions to "hold the line as long as possible" concerning any "selected price increases" [CW, Oct. 1, 1969].

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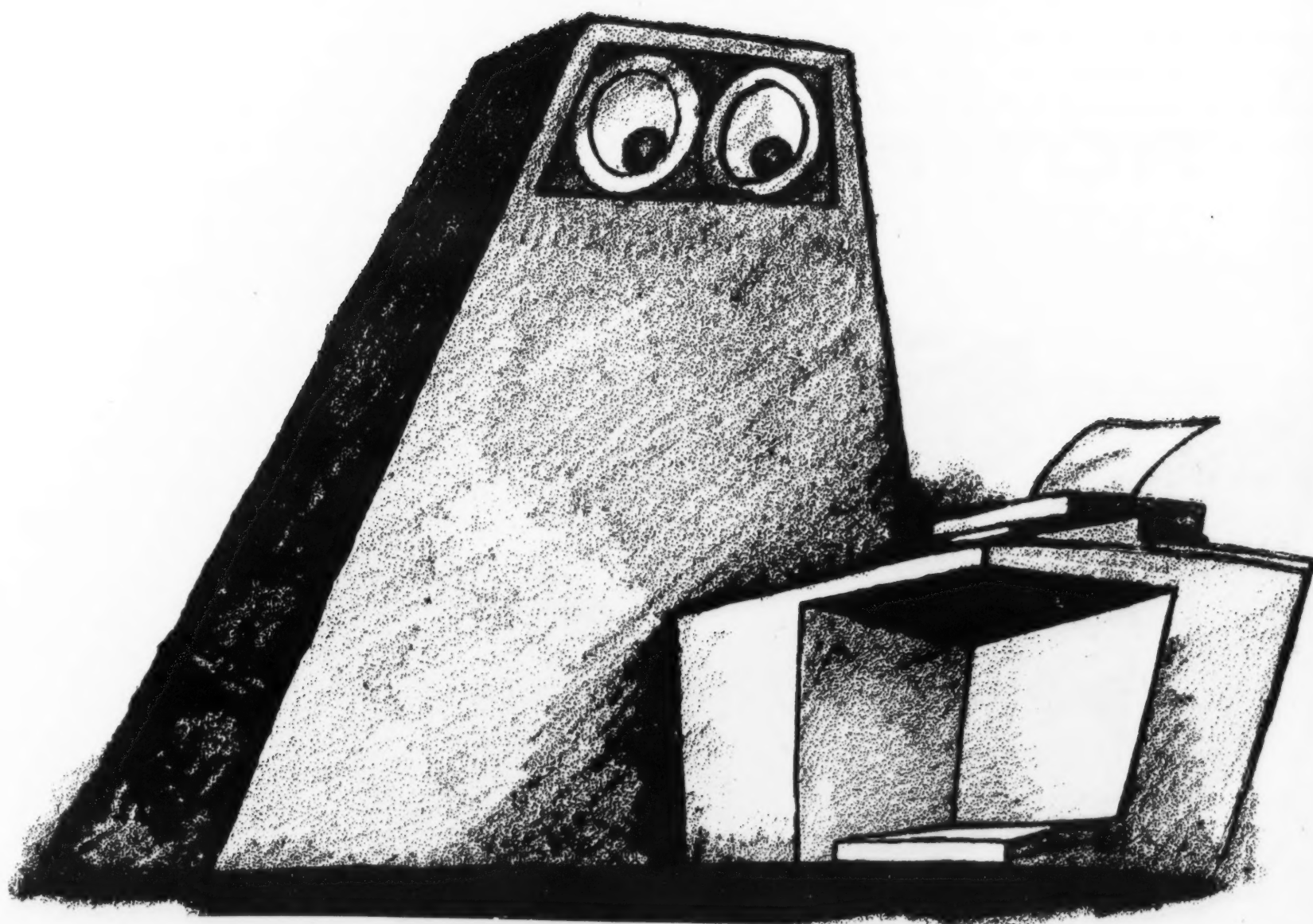
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The Victor Series 800 is a programable computer system in the same price range as conventional terminals. Because it is a computer, it becomes an integral working partner in a communications network. Expensive central computer time is conserved since many tasks can now be shared with the terminal. In addition, operator time is reduced; throughput is increased;

cost/performance results are vastly improved.

The 800 gives you these benefits because it's a computer in its own right, a computer for computers.

Errors are detected and corrected at the source prior to transmission. Programed checks can be performed on all input data while output is formatted to specific needs. Received data can be processed and outputted in any manner desired. Compare this to conventional terminals that do not have this power. The central computer must use valuable time with expensive, time-consuming error detection and correction routines and handler programs.

Packed data is transceived on the 800. Blank fills and right-left justifications are eliminated at the terminal level. The result is a reduction of transmission costs because transmission lines are more efficiently utilized.





# Terminal Computer.

Buffered messages can be automatically retransmitted up to 15 times because of detected errors in character and message parity. This reduces operator time. The terminal is truly responsive to changes inherent in a data communications environment.

The Victor 800 offers concurrent processing. It transceives while performing computations and processing input/output data. Transmission speeds can be easily field changed from 50 to up to 2400 bits per second, synchronous or asynchronous.

And the Victor 800 gives the central computer built-in back-up. If it goes down, the terminals stay operational. The Victor 800 can operate as a free-standing computer, a remote batch processor, and/or as an interactive terminal.

Victor also offers the widest choice of peripheral units—numeric and alphanumeric keyboards plus special function keys, serial printer, 80-column punched card in and out, paper tape in and out, edged punched card in and out and magnetic tape cassette. To further

demonstrate its versatility, multiple Victor 800 Terminal Computers can be interconnected via direct cable or data set to computer compatible magnetic tape as a data collection system.

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# War Belies 'Daily Routine' of Navy Computers Afloat

(Continued from Page 1)

All computer decisions, including those of priority, may be overridden by the men charged with the responsibility for protecting the ship and destroying any threat to her safety.

The computers are conventional digital equipment: 32K, 30-bit words, with printers, plotters, magnetic tapes and card I/O, plus terminals for direct input and interaction by the user.

The programs are written for configurations of anywhere from four main frames down to only one, for emergency conditions.

## Failures Covered

In the event of computer failure during a 4-computer run, the program automatically switches down to the 3-computer version and continues processing. When the fourth is up again, the program switches back.

With this form of back-up there has

been no case of stalled processing in an emergency.

The work could be done as it was "in the old days," with slide rule and grease pencil, but no one seriously considers this will ever be necessary.

The young officers involved in this operation are highly educated specialists, coolly competent and confident, thoroughly knowledgeable in both their own functions and the functions of the equipment. There is no doubt that the computers are as integral to the operation as, say, the power system is to the lives of the men aboard.

## Backup Everywhere

The same is true of the other computer systems on the carrier. Two identical configurations are installed for other intelligence operations, one supplemented by three TRW 130 computers used for photo analysis.

All of the 642's are programmed in CS-1

(compiler system) developed at the Fleet Computer Programming Center by the Navy and Univac.

There is also an administrative computer on board, a Univac 1500 tape system programmed in LAS (assembly language) and running packaged programs coming out of the Fleet Work Study Group in Norfolk, Va., for supply and aircraft maintenance applications.

In these days of cost overruns and grounding of entire models, aircraft maintenance data must be accumulated even if the men doing the job are at war. Without the computer to record and report, it is inevitable that such data from a war zone (which, after all, is where it counts) would be lost.

The supply application for the carrier is conventional, part of the world-wide Mil-strip system (military standard requisitioning and issue procedure). The items carried on board to maintain the men and planes are kept in master files, where

usage is recorded and reorders are created.

## Whirly Cards

Reorders are punched on cards and sent out to a supply ship by helicopter periodically as long as the carrier is on the firing line.

The supply ship is a floating warehouse. Its computer system is compatible with the supply system on the carrier.

It receives the carrier's order several days before the ships rendezvous and prepares machine listings by location for pulling and staging cargo. After the receiving ship has pulled alongside, the cargo is moved across five lines connecting the two ships in an operation the Navy calls "Unrep" (underway replenishment). Last minute changes are made by radio as the Unrep proceeds.

At the same time, the supply ship prepares and sends all completed transactions on cards to the Navy Regional Finance center for billing, and sends its own reorders to the Naval Supply Center in Oakland, Calif. For all these activities, the supply ship uses an old Univac 1004 card system with some added peripheral equipment to expand its capability somewhat. Though unsophisticated, it does a workhorse of a job.

## 24 Hours and 7 Days

The entire record handling system between the two ships is mechanized. Both ships operate their computer centers 24 hours a day, 7 days a week, working two 12-hour shifts per day. The operators do their own maintenance. For emergencies, CE's are flown out from Vietnam (Saigon or Danang) or from Subic Bay in the Philippines.

On the carrier, one officer and 19 men, including keypunch operators, run the administrative computer center in support of the supply and aircraft maintenance activities of 5,100 men with 5,000 active items of general supplies and 76,000 aircraft parts.

Many more men are involved in the other three computer centers which support intelligence activities on the carrier. On the supply ship, 11 men operate in support of a complement of something over 200, maintaining records on 20,000 active general supply items and 15,000 reserve-type items.

## "In Case of War"

The young officer describing the difference said the reserves were "to use in case we get into a war". To him, this is just another job - he has never seen Vietnam and in no real sense does he feel as though he is in a war zone.

Even aboard the carrier, some of the men whose jobs concern the daily operation of the ship have this same sense of remoteness. As one 19-year-old in the computer room said, "We go from one Julian day to the next," not knowing if it is day or night.

However, this same young man has only to go on deck and observe the launching and recovery of the fighter-bombers to see there is a war on - the planes go out loaded with bombs and come back empty.

## Coldly Convincing

There is something coldly convincing about that operation, and it goes on around the clock.

Launch and recovery gives way to Unrep; Unrep gives way to launch and recovery.

There is a rhythm about it, unbroken and uninterrupted. The lives of the men and the mission of their ship depend upon it.

Hundreds of computer hours on these ships play their part in the recurring daily ballet, with no possibility of a return to the old days.

The computer has made its place at sea and is afloat to stay.

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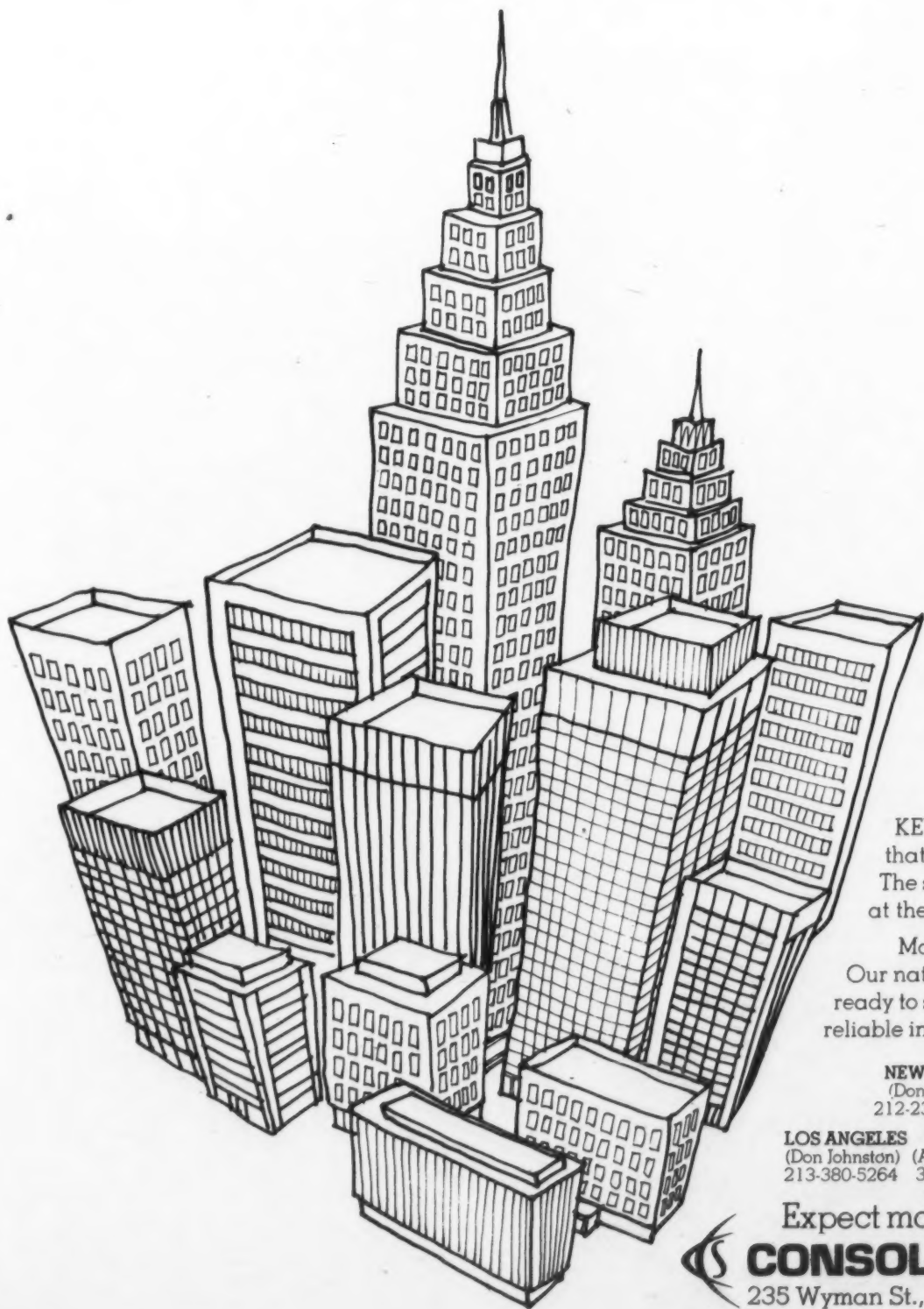
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# Army 'Fights' War of the Future in Secret Calif. Lab

By a CW Staff Writer

**MONTEREY, Calif.** — The Army's Experimentation Command field tests concepts of what war will be like in the next decade or two, and is "a slice of a battlefield of the future," says its commander, Col. Boyd Branson.

Laboratory battleground for the 4,000-man force, created in 1962 under the Combat Development Command, is the 175,000-acre Hunter Liggett Military Reservation. Located 70 miles south of Monterey, the reservation is in a secret, roadless wilderness of grassy valleys, scrub-covered hills, and rocky peaks.

## Soldiers and Scientists

Soldiers and scientists work together testing weapons, equipment, and tactics proposed for tomorrow's army.

From 500 to 2,000 men may be used at one time in field experiments with aircraft, tanks, artillery, and hand guns, all coordinated by computers which are designed to continuously record the changing tide of battle and thus judge the effectiveness of ideas and materials being tested.

A GE 605 records position and event data with an XDS 910 and 930 used to drive targets on the rifle ranges.

"By putting our money where it counts most," says Branson, "we hope to be able in three or four years to compile a complete military data bank, based on information gained from our experiments, from which we can draw data applicable to any military problem."

## All Factors At Hand

Currently under study is a battlefield instrumentation system which tells a commander at a distant post what every aircraft, ground vehicle, and soldier is doing, second by second, and at the same time senses changing weather and lighting conditions.

It includes:

- Helmets with antennas that automatically send a signal to a central computer each time a soldier fires a shot. The soldiers also can receive directives from the computer.

- Rifles that fire pencil-size,

straight beams of laser light instead of bullets. These harmless beams, far weaker than their industrial counterparts, have a range of more than 1,000 yards. When a beam hits one of the sensors which each soldier wears on his helmet, body, or limbs, the sensor sends a signal through a radio in the helmet to the computer.

- Range-finding devices that tell the computer the exact location in real time of every man, vehicle, and aircraft.

- Delicate sensors in aerial

drones and moving targets on the ground that inform the computer not only of direct hits but even how close a near-miss came.

"With all this integrated information," Branson says, "a field commander will know exactly what's going on at all times and be able to base his decisions not on guess and intuition, but on hard data and computer logic."

## More Life-like Game

The new instrumentation system probably will find initial use in heightening realism in war games, says the Army, but at

least parts of it eventually could be adapted to actual combat.

"What we can do in war games," says Branson, "we can do in war."

The Experimentation Command spends some \$10 million a year conducting field trials of equipment ranging from heavy tanks to lightweight leg splints. Sometimes its mission is not to test new weapons, but to find better ways of using old ones, according to the Army.

It was this command, says Branson, which first showed that helicopters, with certain modifi-

cations, could play a vital role in Vietnam.

One of the Experimentation Command's next major assignments will be to compare two airborne night operations systems, each designed to detect enemy troops on the ground.

The Experimentation Command now has more than \$30 million worth of facilities, mostly in instrumented ranges and mobile computers. Its troops, drawn from nearby Ft. Ord or Camp Roberts, are housed in bivouac areas when field trials are under way.



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## Computer Currency System Designed to Replace Money

LOS ANGELES — A new computerized service to retail stores is designed to serve as a universal system of exchange among credit users and credit grantors.

Dr. Melvin E. Salveson, president of Systems General Corp. (SGC), and the originator of Mastercharge, the interbank credit card, predicted that his Electronic Currency System (ECS) will take the place of money as a medium of exchange in the future.

ECS is a complete system which is designed to do the same job as money, Salveson said.

However, it takes advantage of modern computer and systems technology, he continued.

In using the system, each merchant deals only with his regular bank. All negotiable documents are processed in a manner comparable to a bank check.

At the same time each bank is under system-wide control against theft, loss, and fraud.

The system includes a central computer and random access file for each market area of one million or more persons.

It also includes:

- An inquiry-control system

with terminals in the participating stores and banks and connected to the central computer.

- A machine and human-readable plastic card.

- A standard sales draft, MICR encoded and passable as a negotiable check.

The company plans to acquire and to merge with a number of presently independent companies, in order to create new, broader, technical and systems capability.

Data Personnel Consultants (DPC), a Providence- (R.I.) based computer placement ser-

vice, and Rees Associates, Inc., of Boston, have already been acquired in a stock-for-stock trade by SGC.

Dan L. Rees, the founder of Rees Associates, will become president of DPC and Rees Associates division of SGC, according to Salveson.

They plan that each merger would help to create the new kind of computer and advanced systems company which SGC's management believes is needed to pursue the present day opportunities for computer systems.

## Here's another good reason our time-share system is the most popular around:

## 90-day delivery!

You don't have to play the waiting game when you order our HP 2000A Time-Share System. It's ready for you almost as soon as you're ready for it. In most cases, you can take delivery 90 days after we get your order.

But getting customers on the air fast is just one reason for our system's success. There are plenty of others.

Like price. Our system costs only \$90,500. Yet it handles 16 remote terminals simultaneously. This alone gives it one of the lowest costs per terminal-hour in the industry. And the modest initial investment is matched by the 2000A's remarkably low operating cost. Overall, it's the most economical time-sharing system going.

Simplicity is another reason for our system's popularity. HP BASIC is the easiest computer language around. That's why it's a favorite with scientists, engineers, educators, businessmen and other non-programmers. They can learn it in just a couple of hours, because it's almost like talking to the computer in English. Yet because the HP 2000A is so powerful, these users can put it to work on such sophisticated operations as matrixes, strings, and files.

The HP 2000A comes ready for your immediate use. All required software, control terminal and interfaces are included. And this system keeps on working and working. In fact, our customers have already logged over four million terminal-hours of successful, trouble-free operation.

With this kind of money-saving reliability, it's no wonder our time-sharing system is the most popular one around.

Need further proof? Call your local HP computer specialist. Or write to Hewlett-Packard, Palo Alto, California 94304; Europe: 1217 Meyrin-Geneva, Switzerland.

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Wholly owned subsidiary of Data Automation Company, Inc., Dallas, Texas

# **Singer announces a magnetic data recording system that lets you plug in extra capacity. As much as you need. And whenever you need it.**

Introducing the Friden\* 4300 magnetic tape data encoding system. It lets you start small without shortchanging your company's future. Because it lets you plug in extra capacity. As much as you need. Whenever you need it.

Your 4300 system can start with a single Friden 4301 Magnetic Data Recorder. It's a complete table top data entry system by itself. Keyboard. English language alphanumeric display. Two control programs. Magnetic tape deck producing computer-compatible high-density tape (with choice of 200, 556, or 800 bpi densities in 7-track, 800 in 9-track).

And a dial-selected pooling mode. So your free-standing 4301 can become the central pooler for other 4301s or up to eight inexpensive 4302 keyboards. Just plug them into your 4301 and go to work.

And that 4301 remains in your system as you grow to full network configuration with additional keyboards and either 16- or 64-capacity magnetic data central poolers.

You never need a costly multiplexer/controller in your 4300 system. Because your 4301s already contain the logical control, data record segregation, and central recording

backup functions. And that adds up to greater cost-performance efficiency at every size and configuration of 4300 Magnetic Data System.

But that's not all. The Friden 4300 Magnetic Data System simplifies virtually every operational sequence for ease of training and operation. The 4300 associates normal function keys with corresponding program entries, making manual program entry extremely easy. Verification includes keyboard check, read-after-write check, vertical parity check, longitudinal and cyclical redundancy checks, with both visual and audible warnings and keyboard interlock.

And the Friden 4300 units themselves are quiet, compact and attractive. Your 4300 can be in one room. Or stretched across the nation with the addition of telephone communications links.

So your Friden 4300 Magnetic Data Recording System grows as you grow. And you can lease it for a year. Or better still, enjoy savings on two- or three-year leases. It's the industry's most attractive lease plan — an innovation in itself.

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It should have no defects at all. Especially no rub-off. And of course every reel

ought to be certified 100% error-free by its manufacturer.

Come to think of it, that sounds exactly like the tape we make at Graham.

But our tape, as good as it is, is really just a means to an end. Dependability is what we're really selling.

Just think about it. Wouldn't

you like to forget about tape? Then remember Graham. Just long enough to give us your order, and to get it in your system.

Then forget about it.

 **GRAHAM  
MAGNETICS**

*means to an end.*





March 11, 1970

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# Real Estate System Eliminates Extensive Bookkeeping

BETHESDA, Md. — Fast Rents, a real-estate software system intended to streamline and control input and cover every contingency in a property manager's office, is available for licensing from Hughes Computer Systems.

Developed by Hughes to service its own clients in the Washington area, the Fast Rents system has been in use for several years and is said to be processing thousands of rental units and large quantities of commercial property.

The system, which has been running on the firm's IBM

360/30 and 40, uses about 80 programs to produce a comprehensive range of reports. Typical volumes serviced by the system extend from 500 to 20,000 rental units. Any form of ownership and any system of management can be serviced by Fast Rents, the company says.

## Monthly Accounting

According to John Quigley, company treasurer, the system performs the entire monthly accounting cycle for the property manager by regenerating itself from month to month with necessary changes and revisions.

Numerous edit checks have been incorporated, Quigley said, to validate input and diagnose accounting irregularities. Lease expiration analyses, tenant history files, comparative operating statements, and budgets, in addition to the conventional cycle of journals, ledgers, and other reports, are featured by the system, he said. Payrolls are also prepared and entries generated into the agent's books with the system.

Hughes Computer Systems, Inc. has its corporate and computing headquarters at 7702 Norfolk Ave.

## Varian Offers 'MOS' Integrated-Operating Master Software for Its 620/i Computer

IRVINE, Calif. — Varian Data Machines is offering a new software system free to users of its Varian 620/i computer.

The software innovations have been integrated into a single master operating system (MOS) that includes input and output control, system executive, system loader, assembler, Fortran IV compiler, and maintenance and debugging packages.

The MOS software system is applicable to any 620/i installation with a minimum of 8K memory, a teletypewriter, and either a drum memory or a magnetic tape transport. The latter are used by the system to store and process various parts of the MOS software and to act as a reservoir for the user programs generated by MOS.

The number and type of peripherals can be expanded beyond those included in this minimum configuration, according to the firm. The MOS package includes I/O drivers for such additional items as line printers, high-speed paper-tape reader and punch, card readers, and additional magnetic tape units. The system can incorporate any combination of these peripherals and as many as required of each

type.

To give the user flexibility in the selection and use of such 620/i peripherals, the MOS system treats them as logical elements rather than specifically assigned hardware items. The MOS programs refer to peripherals in general terms such as systems file, processor input, list output, and user scratch units.

One part of MOS is a system preparation program that configures the universal MOS software supplied by Varian to a user's particular system configuration. Two maintenance programs are included in the system. One is designed for maintenance of the system itself, adding, deleting, or changing programs within the MOS library. The second maintenance program is for creating, copying, and correcting Varian 620/i symbolic source files, such as assembler source statements, program input data, and Fortran source statements.

Object programs created by the MOS assembler or Fortran compiler can be readily debugged, the company said, using a utility program created specifically for MOS. The debugging capabilities include directives to search the

entire memory for special values, or to interrogate or change the MOS logical unit assignments.

The Fortran IV compiler within the MOS system is designed as a one-pass operation to provide maximum compilation speed, the firm said. The programs generated by MOS using the assembler or Fortran compiler are in the form of compatible, relocatable, linking object codes.

Varian Data Machines is located at 2722 Michelson Drive.

The Multipurpose Rent Form, with the relevant spaces completed, will effect control on property manager's books and records.

## Package Prepares Ledgers on B3500s

LOS ANGELES — A general ledger accounting package for Burroughs B2500 and B3500 users is being offered jointly by Computer Sciences Corp. and Ennis Brandon Computer Services, Inc.

Roger M. Fisher, general manager of Computer Sciences' applications systems department, said the new package is a modification of CSC's GL II system which was designed for IBM 360 computers.

Known as Burroughs GL II, the system is said to automatically prepare general ledgers, subsidiary ledgers, voucher and invoice records, and other budgetary reports.

The package is being offered by Computer Sciences to banks, service bureaus, and other organizations having their own computers. Ennis Brandon is offering the package to clients of its computer service bureaus.

According to Fisher, the most attractive feature of the system is its flexibility, which enables it to produce reports in a variety of formats to meet clients' preferences. Also cited was a comprehensive edit and validation program that is said to prevent erroneous data from entering master files, and the calculation of percentages for each item on a number of reports.

Among the reports produced by the general ledger package are transaction posting registers, balance sheets, income statements, asset depreciation schedules, and employee wage and tax schedules.

The Burroughs GL II system is

written in Cobol and operates under a standard Burroughs 13K MCP operating system. The system can be used on any B2500 or B3500 with 60K memory, three tapes, 10 million bytes of disk storage, card reader, and printer.

Documentation provided with the system consists of system, user, and operator manuals. They include such things as program description and source listings, system flow charts, and record layouts.

The price of the system is \$20,000. This includes one week

of on-site support which includes personnel training.

The system is guaranteed for 180 days. Beyond that, a systems update service is available for \$100/mo, which would include any future debugging enhancements, and new revision levels of the Burroughs operating system, if they affect the GL II system, a spokesman said. Follow-on support is provided by field technical representatives who make regular calls on all users to help correct problems with the system, according to CSC.

## Remote Computing Adds Financial Planning Program to T/S Library

LOS ANGELES — A program that facilitates financial planning and executive decision-making has been added to the Remote Computing Corp. library of application programs for use in a time-sharing environment.

The program, Foresight I, can evaluate and predict the impact of alternative courses of action and changing conditions on a company's financial posture. It produces, as output, profit and loss statements, balance sheets, budget projections, marketing forecasts, and other financial reports.

Foresight I can be used by employees who have neither programming skills nor knowledge of computer operations, claims R.W. Pearson, marketing vice-president.

Personnel stationed at desk-side teletypewriters enter facts and figures, and then instruct

Remote Computing's central system as to the computations required.

Remote Computing Corp. supplies Foresight I to customers at the following rates: \$.13/sec of CPU time, plus \$1.30/min of I/O time, plus \$5/hr connect time.

Remote Computing Corp. is located at One Wilshire Bldg., Los Angeles.

## Microfilming Service Included in 'Medic'

NEW YORK — Medic, the hospital and medical information system of Gamut Systems, Inc. has been expanded to include microfilming, the recording of patient reports via "microforms." Microforms include microfich, roll film (cartridge), or jackets if frequent updating is desired. Gamut Systems, Inc. is located at 49 West 57th St.



"He Must Have Come Up With Some New Approach to a Problem."

# Payroll System Processes Exemptions and Piecework

PAY CENTER XXXX		EMPLOYEE MASTER FILE				MM/DD/YY		PAGE XX						
LIST														
.X.XXXXXXXXXXXXXXXXXX XXXXXXXXX														
----- PERSONAL DATA -----			----- PAY INFORMATION -----			----- TAXES AND DEDUCTIONS -----								
						ID	FR	CL	NT	AMT	INITIAL	REMAIN	QTD	YTD
K NAME -						SICK PAY						XXXXX.XX	XXXXX.XX	
DDRESS - XXXXXXXXXXXXXXXXXXXX			SALARY XXXXX.XX			GROSS						XXXXX.XX	XXXXX.XX	
XXXXXXXXXXXXXXXXXXXX			HOURLY RATE XX.XXX			FWH TAX						XXXXX.XX	XXXXX.XX	
XXXXXXXXXXXXXXXXXXXX			SICK LEAVE RATE XX.XXX			STATE TAX						XXXXX.XX	XXXXX.XX	
XXXXXX			SICK LEAVE ACCRUED XXX.XXX-			LOCAL TAX						XXXXX.XX	XXXXX.XX	
ELEPHONE XXX-XXX-XXXX SEX-X			ANNUAL LEAVE RATE XX.XXX			FICA						XXXXX.XX	XXXXX.XX	
OCIAL SECURITY NUMBER XXX-XX-XXXX			ANNUAL LEAVE ACCRUED XXX.XXX-			SUI						XXXXX.XX	XXXXX.XX	

Portion of Employee Master File List Produced by Payroll System

## If you've been wanting someone to build a low-cost digital tape drive with Hewlett-Packard quality, HP just did.

We've taken the OEM experience we've gained from putting almost 4000 digital tape systems in the field. Added what you've told us you'd like to see in a low-cost tape drive for small computers and off-line applications. And produced the HP 7970.

It has all the features you're looking for in a digital transport: IBM and ASCII compatibility, 25 ips speed without program restrictions, DTL/TTL compatible interface. Seven or nine track capability with simple field conversion. Standard 10½ inch reels. Plus handsome appearance, fingertip push-

button controls, backlit indicators for quick operational status checks, dual gap head for read-after-write error checking capability.

It also has HP's exclusive trouble-free design and rugged construction, with cast aluminum frame, automatically-milled to precise reference planes. The tape transport components are mounted to this frame on precisely indexed bosses to assure that tape path tolerances are routine. The HP 7970 also has electronic deskewing, direct drive motors, single capstan, and dynamic braking that eliminates mechanical adjustments. Plus

the back-up capability of 141 Hewlett-Packard sales and service offices around the world.

So if you want a low cost digital tape drive with HP quality, call your Hewlett-Packard field engineer for more information on our new 7970. Or write Hewlett-Packard, Palo Alto, California 94304; Europe: 1217 Meyrin-Geneva, Switzerland.

**HEWLETT  PACKARD**  
MAGNETIC RECORDERS  
42907

WASHINGTON, D.C. — A payroll package with the ability to process data on exempt, hourly, and piecework employees in the same run for several companies has been announced by Delta Data Systems.

Designed for the private user as well as for service bureaus, the system is written in Cobol and consists of 29 programs and sorts. Originally written for the IBM 360/30 tape or disk, the system is upward compatible on larger 360s under DOS, TOS, or OS, according to Delta.

### Software/Services

The payroll system is designed to interface with the Delta general-ledger system as are the accounts-receivable and accounts-payable systems, thereby providing a full-service accounting system, a company spokesman stated.

Special features of the system include multicompartment processing; multiple pay centers within company; automatic calculation for any combination of federal, state, and local taxes; up to fifteen taxable or non-taxable deductions; automatic calculation of Fica and state unemployment tax; multi-union processing; automatic accrual of sick leave and vacation hours; provision for pay advances taxed at the normal rate; single entry point of all data; and percentage increase over normal gross pay.

Documentation of the system includes the User's Guide, Operator's Guide, and Input/Output formats.

Programs will be delivered in the form of source listings and source decks.

The purchase price of \$12,000 includes the services of one staff member for system implementation, customer orientation, and minor modifications to tailor the system for individual customer requirements.

Delta Data Systems is located at 9903 Rhode Island Ave., College Park, Md.

### Convert-A-Code Sells Translator Package

BALTIMORE — After two years of providing the conversion service, Convert-A-Code Corp. has made available its translator package for sale.

The translator, which converts all IBM 1401, 1440, and 1460 programs to System/360 assembly language, is priced at \$9,000, including documentation and installation, the company says.

Convert-A-Code is located at 30 S. Calvert St.





# the Mark I converter reduces computer workload

Normally, conversions are done on a computer.

punched cards are transcribed onto tape, or small reels of computer tape are pooled onto a single reel.

**The Result:** heavy computer workload for routine conversion.

Cybercom offers something different—the Mark I key-to-tape encoder and converter system.

The Mark I key encoder records data directly onto quarter-inch digital tape cartridges, then pools the data "off-line" onto computer tape at a converter



station. The computer sees only complete reels of data ready for processing. Total preparation of input work is done in the input room.

The Mark I eliminates the computer input bind caused when many small reels of computer tape are converted to a single reel.

Tape loading is faster and more convenient; remote processing capability is increased because the cartridges may be transported easily.

Most important of all, the Mark I system frees your computer for profitable work.

Write for a brochure today.

Delivery: 60 days

a generation ahead in human engineering.



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### Her learning curve is beautiful

The young lady immediately behind this rare pin just graduated from the most exclusive finishing school in the computer industry. Her alma mater is the

Caelus® Service Center Training School in San Jose, California, home of Caelus disk packs. If you would like a seminar conducted on the care and handling

of disk packs—call your Caelus girl. She and her counterparts are ready, now, to provide professional service for your memory system.



**CAELUS® MEMORIES, INC.** P.O. Box 6297, San Jose, California 95133. Telephone (408) 298-7080

# Pricing System Improves Management Capabilities

SAN MATEO, Calif. — URS Data Sciences Co. is offering two new packages: one is a bond accounting pricing system that provides banks with complete management information capabilities for municipal and government portfolios; the other is a subprogram for retrieval of specific information from files.

Developed originally by United Virginia Bankshares, Inc., the pricing system enables banks to price bonds more frequently, to obtain pricing schedules, and to communicate within multibank organizations through uniform reports and data.

The pricing system, a standard package written in Cobol, is composed of two separate but integrated sets of programs: bond accounting and bond pricing. The bond accounting program, designed to produce a securities subsidiary ledger includes editing, accounting, tax reporting, and a coupon program.

The bond pricing program generates current market appraisals of government

and municipal portfolios by offering five reports: statistical; combined portfolio pricing summary; category summary of current values; individual pricing; and an escrow report.

Including initial technical installation support, the entire package may be purchased for \$10,000 or separately; bond accounting costs \$6,000; and pricing costs \$4,000.

## File Analysis

URS's second new program significantly increases the effectiveness of selecting specific records from IBM 360 data files. Fast (File Analysis and Selection Techniques) is a subprogram used for determining which records within a given file meet the criteria established by variable sets of easily defined parameter cards.

Priced at \$650, its features include the ability to select a subset of data from a file in response to a special request, comparison of one record field to an-

other, variable range selection, and specific value selection.

Written in basic assembly language to be inserted in Bal or Cobol programs, almost

any type of disk or tape file can be handled, the company says.

URS Data Sciences Co. is located at 1700 South El Camino Real.

## Package Simulates System Design

BOSTON, Mass. — A software package which combines systems engineering techniques with digital simulation language and linear programming, has been developed by Stone & Webster Engineering Corp., Boston.

The programming package, called Swapso (Stone & Webster All Purpose Simulator and Optimizer), utilizes systems analysis approaches, according to the firm.

The package comprises four main parts: simulation of the dynamic behavior of continuous processes; continuous updating of the coefficients of empirical equations by statistical subprograms; and op-

eration profitability by nonlinear programming techniques.

Performing off-line simulation, on-line control, and economic optimization, the package can be applied either to a new process or to preparation of daily operational reports for management on an existing process or plant. The plant control system can be reset to Swapso-com-

## Software/Services

puted optimum conditions in closed-loop supervisory control. The combination of simulation and optimization permits troubleshooting of an entire system prior to operation, the company claims.

The price varies to fit individual situations, according to a company spokesman.

The company is located at 225 Franklin St.



## Logically speaking... an error-free data input system keeps your computer from going "out to lunch."

A computer should eat up data, not expensive time. If we make it sound overly simple, we're just being logical. For we've got an error-free data entry system that keeps computers working without those costly "out-to-lunch" breaks.

It's called the LC-720 KeyDisc Data Input System. It cuts systems time and costs... by as much as 50%. It minimizes errors with point-of-entry editing and correction. It optimizes systems throughput.

And it keeps your computer working all the time.

Computer time-shared data from up to 60 key stations... all entering or verifying separate jobs and applications... is one of the big advantages of the LC-720.

It also offers you total security and high speed random access of data. The LC-720 is the only

keydisc system in use that provides a complete IBM/360 compatible disc. Plus a totally compatible 7 or 9 track magnetic tape output.

Logic makes the *Now Generation* of data collection systems. So, if you've got data input problems, Lewis Barr at Logic can more than likely solve them. Give him a call. 609-424-3150.

It's the logical thing to do.

## LC-720 KeyDisc System



21 Olney Avenue • Cherry Hill Industrial Park • Cherry Hill, N.J. 08034 • (609) 424-3150



## Boston Data Center Serves Engineers

CAMBRIDGE, Mass. — Engineering Computer International (ECI) has opened a service center to serve the data processing needs of engineering and scientific organizations in the greater Boston area.

ECI acts as an agency for retailing commissioned time through a data communications terminal, which is connected by phone lines to coupled IBM 360/65/75 at McDonnell Automation Co. in St. Louis, Mo.

According to Dr. Robert Logcher, an ECI founder, the joint venture with McDonnell involves marketing of ECI's improved version of the Integrated Civil Engineering System (Ices) originally developed at MIT. ECI licenses the system to its customers at \$200/mo. Also available through ECI is a structural design system (Strugl) leased at \$300/mo.

ECI is located at 1033 Massachusetts Ave., Cambridge, Mass.

## Mini-Manual Explains IBM's Version of APL

NEW YORK — The APL Mini-Manual describes a condensed version of APL, IBM's general purpose computer language. The Mini-Manual, useful as a reference for problem areas in programming, presents popular routines, answers questions, and includes a summary of system commands, keyboard operators, and mixed and hybrid functions. It is available through Industrial Computer Systems, 254 W. 31 St.

## APL T/S Service Available Along Eastern Seaboard

NEW YORK — APL (A Programming Language) time-sharing service is now available along the entire eastern seaboard. System access can be made by a local call in five major cities: Boston, Manhattan, Philadelphia, Washington, and Miami. The service is available from Industrial Computer Systems, 254 W. 31 St.



March 11, 1970

Page 29

## System for PDP-8 Based on Videojet Impact Printer

DALLAS — A printer system for the PDP-8 computer, based on the A.B. Dick Videojet printer, has been announced by Eclectic Computer Corp.

The system, called the Eclectic

740, provides output at 250 char/sec on lines up to 136 characters long. Included in the system are the printer and complete hardware, and software for interfacing with the PDP-8.

Software includes a text-handling package that will print one line at a time from a variable-length text buffer along with a diagnostic software routine to check printer and system functions.

Hardware supplied includes a controller, interface, and all required cables, in addition to the printer.

The printer accepts eight-bit Ascii code via accumulator transfers through the computer's I/O bus.

Features of the unit include adjustable character height and width. Line width is also variable, ranging from one to 136 characters at 10 char/in.

Although carbon copies cannot be made, Eclectic says that multiple copies of the printer's output are easily available.

The printer display can be adjusted to provide Xerox reproducible copy in either 8-1/2 in. by 11 in. or 8-1/2 in. by 14 in. formats. If volume reproduction is required, the printer can be equipped with master paper and ink to provide masters for offset printing.

First deliveries of the Eclectic 740 are scheduled for the middle of April. The system will be available on a 60-day schedule thereafter.



Eclectic 740 Printer System

The system may be either leased for \$275/mo, not including maintenance, or purchased for approximately \$7,500 to

\$8,000, depending on configuration.

Eclectic Computer Corp. is located at 3707 Rawlins Ave.

## Test Set Shows System Errors During Operation

MIAMI — A new version of International Communications Corp.'s (ICC) Model 110D allows access for testing while data processing equipment operates normally.

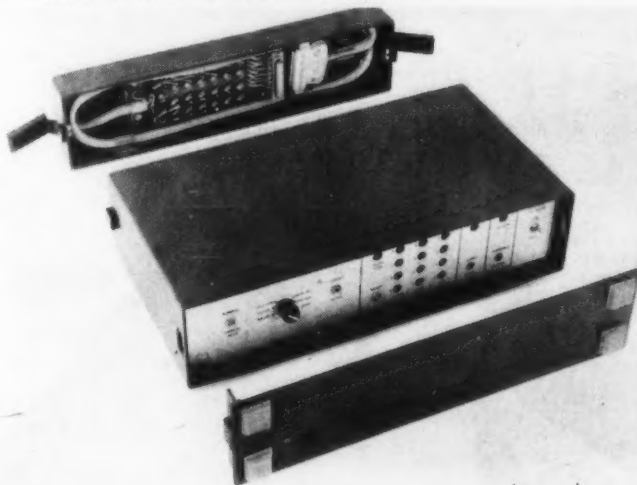
A portable, 8-pound unit, the 110D is reported to provide accurate isolation of faults in data communications systems, and is designed for use by both technical and non-technical personnel.

The ICC test set evaluates data transmission systems using synchronous modems that operate at any speed from 10 to 33,000 bit/sec and are equipped for RS232B/CCITT V.24 inter-

face, supplying their own clock. The test set synchronizes itself with the received digital data stream, detects errors, and displays the errors on front panel lights.

The set is capable of supplying the 511 bit/sec, pseudo-random pattern standard with CCITT as well as the standard ICC and Western Electric test pattern rates of 2,047 and 63 bit/sec, the company says.

The Model 110D transmission test set may be purchased for \$1,450. The unit is available for immediate delivery, according to ICC, located here at 7620 N.W. 36th Ave.



110 Test Set

## S/360-Compatible Mag Tape Transport Features Terminal Pooling Application

CHATSWORTH, Calif. — A family of IBM 360-compatible magnetic tape transports is being offered by Peripheral Equipment Corp.

Called the Model 6840, the device is designed for use with small- and medium-scale systems, data terminal pooling, and

other mass storage applications.

The 6840 utilizes a read-after-write, dual stack head with either nine-track (1,600 bit/in. or dual-density) or seven-track configurations. Tape speeds range from 37.5, 25, 18.75, and 12.5 in./sec with a rewind speed of 150.

Features of the 6840 include a single-capstan velocity servo-system and an adjustment-free, tape-guide system which utilizes spring-loaded edge guides located on each side of the read-

after-write head.

A write/read, single-gap head series, the Model 6860, is offered for applications not requiring the read-after-write feature. The 6860 provides the same electrical and mechanical features as the 6840 except for the read-after-write capability.

The 6840 is priced at \$4,700, the 6860 at \$4,400, for single unit orders. Delivery is about 90 days.

The company is located at 9551 Irondale Ave.



6840 Tape Transport

## Coupler Compensates for Noisy Lines

HAUPPAUGE, N.Y. — An acoustic coupler that promises to compensate for weak and noisy telephone lines is available from Applied Digital Data Systems Inc.

Called COM 100, the 300 baud coupler is said to reduce second harmonic distortion, which has been plaguing acoustic couplers for years, according to Dr. Reuven Meidan, the developer.

The solution involves the addition of a third harmonic which, according to Meidan, virtually cancels the interfering second harmonic.

Other design features of the unit include an enclosed handset chamber and the use of an optimum handset cradle position which, says Meidan, adds a significant degree of stability to the output signal.

Compatible with the Bell System 103 data set, the COM 100 is available in three models. The COM 110 is for acoustic coupling only. The COM 120 is for direct connection to a telephone line via a DAA (Data Access Arrangement). The COM 130 can perform both functions.

ADDS has announced two op-

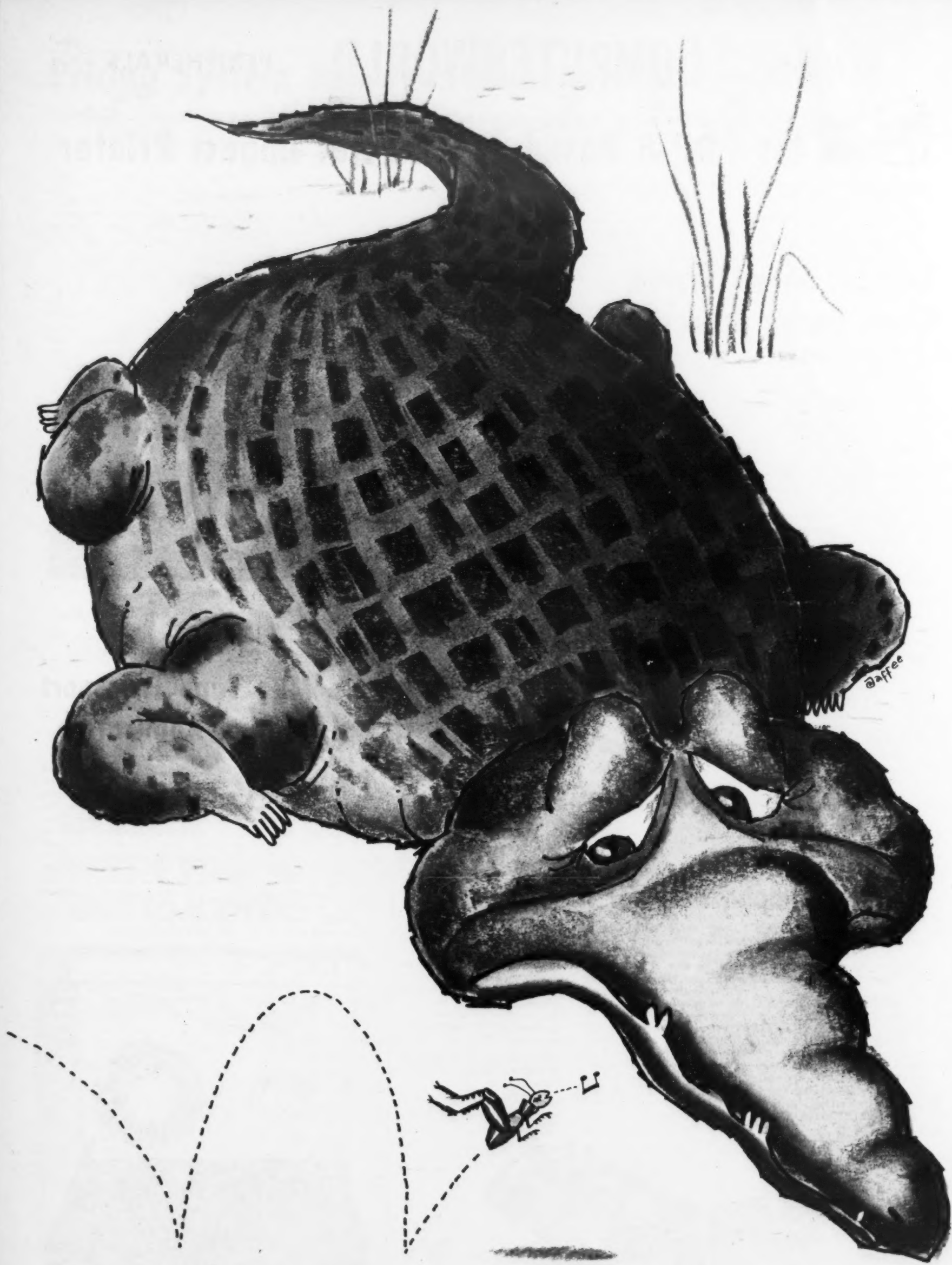
tions for the series. With the "remote echo" option, the coupler will echo the received data back to the computer for verification. A second option allows parallel data interfacing between the coupler and user's equipment as an alternative to the standard TTY and EIA serial data interfaces.

Prices start at about \$500, according to ADDS. Delivery is 120 days.

Applied Digital Data Systems Inc. is located at 89 Marcus Blvd.



COM 100 Acoustic Coupler





# Sluggish system?

Big computers can be made to move fast with the proper input diet.

That's why Inforex developed Intelligent Key Entry.™

Inforex feeds hungry CPU's. It does electronically what other forms of data entry do mechanically.

**The Inforex system** gathers data from eight keyboards into one disc memory unit. Data may be sight or key verified. Built-in logic performs check digits, left-zeros and balance totalling. Jobs are pooled onto 7 or 9-track compatible tape. Optionally, it will operate on-line directly to your central processor.

**Keypunch/verifier functions.**

Starting with the familiar 64-character keyboard, each Inforex keystation performs all keypunch and verifier functions: Automatic check-digit computation. Automatic left zeros. No digit by digit keying is necessary. Electronic skipping and duplicating rather than mechanical. Auxiliary duplication or two additional levels of program control. Automatic + or - signing of fields.

**Simultaneous entry and verification.**

All eight keystations input to one disc memory unit. Each keystation is assigned an area as it enters. Any keystation can access any assigned area at any time.

Since each keystation has both sight and key verification capability, one keystation can verify work entered on another and if desired, verification can be done simultaneously with data entry.

**Keyboard to tape functions.**

Inforex automatically pools input from up to eight keystations onto 7 or 9-track compatible tape. One easily entered statement transfers a series of batches. Only one keystation is required to initiate the transfer, and all keystations are functional during transfer. There are no cartridges to handle or identify, no special equipment needed for pooling.

**Recallable programs.**

Each program has four levels of control. Once the program is keyed, it can be stored for future use and recalled by any operator merely by keying its appropriate program name. Up to 128 different program controls can be stored. There's no program card or tape mounting and no repetitive program control keying.

**Self-balancing.** Zero balancing is an integral part of the Inforex system. Each operator may accumulate a control total during data entry. Edit controls allow rapid correction. Adjustments to

the balance total occur automatically during verification.

**128-character records.** With Inforex Intelligent Key Entry, the record length is variable up to 128 characters.

**Full record display.** For added accuracy, each keystation displays an entire 128-character record with moving cursor and position counter. The system has a forms capability that allows data entry and verification in a "fill-in-the-blank" fashion. Operator messages for direct interaction with the system along with search and paging of a file are standard.

**Attractive office decor.** Inforex design innovation doesn't stop with the components. Each Inforex keystation is built into an attractive contemporary walnut and black steel desk designed for operator ease and comfort. And remember, the system is electronic, not mechanical, allowing a quiet, comfortable atmosphere to work in.

**Inforex monthly rental cost is \$50 per keystation. \$560 for control unit (up to 8 keystations).**

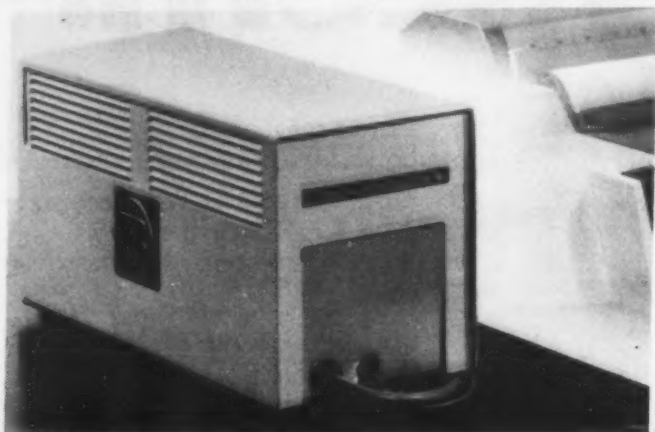
**\$960 for a complete 8 keystation system, including maintenance.**

Inforex, Inc., 21 North Avenue, Burlington, Mass. 01803 or, Inforex AG, Dornacherstrasse 210, Basel, Switzerland.

## "Inforex it"

# Burroughs Has 1,200-Bit/Sec Modems

DETROIT — A family of electronic data and computer systems is available from Burroughs Corp. Digital data is transmitted in a serial, binary form at up to 1,200 bit/sec. A feature for on-line users is the reduction of line stabilization to 16 thousandths of a second, which reportedly improves the response times of Burroughs terminals.



TA212 Electronic Data Set

The three data sets or modems in the series, TA211, TA212, and TA713 are designed for use with Burroughs TC500 or TC700 series of terminal computers.

The TA713 is designed to function with Burroughs central computers, as well as with all other Burroughs terminals, and with similar types of equipment made by other manufacturers.

Prices of the data sets range from \$590 to \$790. The series may be leased from \$15 to \$20 per month. Burroughs states that purchase prices will vary according to the capability and quantity of modems ordered. Deliveries are now being made, according to the company.

Burroughs Corp. is located at 6071 Second Ave.



Cartrifile 4096

## Disk Drive Controller For Minis Low-Cost

SANTA ANA, Calif. — A low-cost disk drive controller for 16-bit minicomputers and IBM 2311/2314 disk drives has been developed by the Electronic Engineering Co. (EECO).

Designated the EECO 1660 Discontroller, the device reportedly allows users of 16-bit minicomputers to take advantage of the bulk data storage and msec access time of large movable-head disk memories.

The 3-1/2-in. high controller is priced in the \$8,000 to \$9,000 range, the company reports. EECO Data Format is based on 10 to 20 sector records of 384 bytes each. This utilization provides, EECO claims, up to 53% more data bytes per disk pack than standard IBM format.

The software package required is different for each minicomputer, but only two

## systems/ peripherals

basic commands — READ and WRITE — are needed. EECO stated that it will provide software assistance and eventually will supply complete software packages for all popular minicomputers.

Deliveries of Discontrollers starting with a model to mate Data General's Nova to IBM 2311 disk drives will be made in 60 days, EECO says. Models for other popular 16-bit computers will be available starting in May.

Electronic Engineering Co. is located at 1601 E. Chestnut Ave.

## Cassette System Sorts Magnetic Tape Data

MOUNTAIN VIEW, Calif. — Fitted with a digital magnetic tape system produced by Tri-Data Corp., Digital Equipment Corp. PDP-8 computers can sort, match, collate, and merge data.

Designated the Cartrifile 4096, the DEC-compatible system is cartridge-loaded and combines four magnetic tape transports and controller in a single unit.

A software package included in the price provides system I/O, a basic control system driver and diagnostic program subroutines. The four Cartrifile tapes may be used independently and in any



1660 Discontroller

sequence; tape may be written while any other is being read, according to the company.

The company guarantees data accuracy by redundant recording and on-the-fly error correction.

The Cartrifile 4096 with positive-logic interface costs \$5,700; with negative-logic interface \$6,000.

Tri-Data Corp. is located at 800 Maude Ave.

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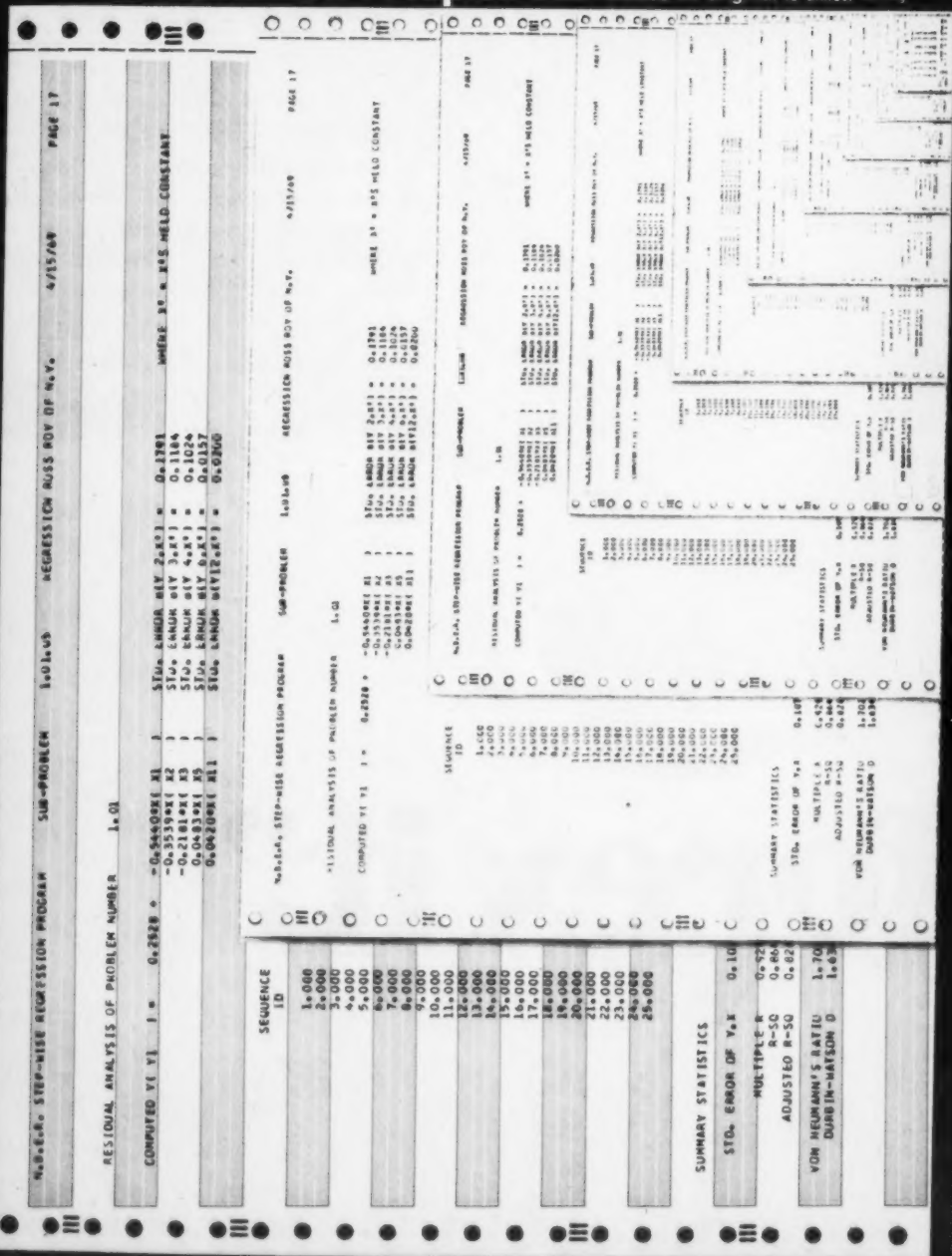


originals simultaneously to get two copies for less than the price of one.

Sure an "X" copier has the same versatility. But it costs more than twice as much to lease as a 1714 costs to buy. And you save even more with a leased 1714.

Send for a free Minoltafax test kit. It's an eye opener. Minolta Corporation, Business Equipment Division, 200 Park Ave. South, N.Y. N.Y. 10003. (212) 674-8525.

## The Minoltafax 1714 copier. It can reduce an original to almost nothing.





## DEC Adds Interfaces for PDP-8/I, -8/L, Device Selector to Line of IC Modules

MAYNARD, Mass. — Digital Equipment Corp. (DEC) has added three modules to its M-Series line and computer interface IC modules.

The three modules are:

- M107 device selector — a double-height, single-card interface through which the user can select, via Teletype or software instructions, as many as seven

### dp accessories

peripheral devices. It provides seven discrete I/O transfer pulses for the devices, plus five additional pulses, which reduce software requirements by permitting

combinations of I/O transfer pulses, according to DEC. The cost is \$115.

- M738 counter buffer interface — a double-height, single-width board designed to strobe 12 parallel bits onto the positive bus of DEC PDP-8/I or PDP-8/L computers. The unit consists of a 12-bit bus driver, 12-bit up counter, and a clock input gate. The M738 sells for \$105.

- M737, 12-bit, bus receiver interface — a double-height, single-width module designed to receive and store 12 parallel data bits in a buffer register from the positive bus of the PDP-8/I or PDP-8/L. It is pin-compatible with the M738 counter buffer interface and the M107 device selector. The M737 consists of a device selector, flag, and buffer register. The unit costs \$120.

## 'Black Watch' Premium Mag Tape Safeguards Itself Against Damage

ST PAUL, Minn. — The 3M Company has developed a computer tape called Black Watch which is designed to guard itself against physical damage, both on the transport and in transit, through a textured substrate.

This Scotch brand 700 computer tape is available for immediate delivery. The substrate of the tape, says 3M, resists windowing and cinching even under adverse environmental conditions. This feature reportedly eliminates scratching, thereby minimizing transitory dropouts caused by polyester shavings, the firm says.

An electrically conductive backing protects against static hand-ups and reduces dropouts resulting from the static attraction of air-borne contaminants, the company continues.

Compressibility, claimed to be twice that of conventional tape, minimizes the effects of wound-in debris and worked edges, 3M says. Black Watch is also said to reduce dynamic skew.

A company spokesman said that Black Watch premium tape sells for approximately 15% more than 3M's other tapes.

The 3M Company is located at the 3M Center.



Work Station for IBM Terminals

## Work Stations Designed For IBM 2740 Terminals

WORCESTER, Mass. — Work stations for use with IBM terminals 2740 Mod I, 2740 Mod II, and 2741 are available for immediate delivery from Wright Line, a division of Barry Wright Corp.

With non-glare, plastic-laminated tops, the units are equipped with two drawers and a security lock. The removable top drawer, with pencil tray and adjustable interior, can house a

Bell data set, according to the company. An opening in the rear of the cabinet allows for passage of cables.

Work station Model 2740-10 is for use with IBM terminals 2740 Mod I and 2741. Model 2740-20 is used with IBM terminal 2740 Mod II. Both units cost \$125.

Wright Line is located at 160 Gold Star Blvd.

## Equipment For Sale

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# Honeywell delivers Keytape.\* No excuses.

We know how eager people can be to get their new Honeywell Keytape equipment.

It's the kind of enthusiasm we expect. After all, consider the advantages that Keytape data preparation has over keypunching.

Benefits like faster, more accurate data transcription. Faster data input to the computer. Reduced operating expense. Simple error correction. Improved storage and handling. Lower noise level. Happier operators.

You can also do a lot of things with Keytape that you could never do with Keypunch. Things like communicating from remote locations, printing out hard copy, converting cards or paper tape, pooling data from multiple units, validating check digits, adding and listing. Altogether we have 52 different models in both seven-channel and nine-channel configurations.

So if you're in a hurry to get your Keytape equipment, we understand. That's why we deliver. Fast.

Even if it means a little extra effort on our part.

HONEYWELL INTERNATIONAL  
Sales and service offices in principal cities of the world  
\* Trademark of Honeywell Inc.

The Other Computer Company:  
**Honeywell**





## Mini-Digitizer Drawings Illustrate Graphic Data

ROCKVILLE, Md. — A new mini-digitizer providing conversion, scaling, and recording of analog/graphic data, at what is described as low cost, is available from Computer Equipment Corp.

The Minmac Graphic Data Converter system permits inde-

punch, teleprinter, or a small computer, such as the Wang 700.

According to CEC, the Minmac converts the graphic data into scaled digital X and Y coordinate data; records it; and displays the coordinate values on a built-in visual display. It can perform in either a point or line (tracing) mode, with actuation consisting of tracing a pattern or pointing to a position with the system's cross-hair reader head, CEC said.

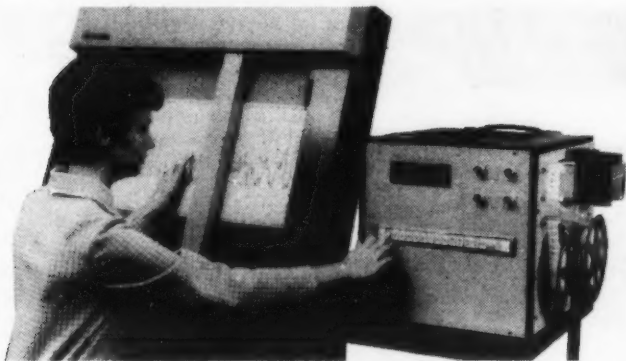
Overall accuracy is claimed to be 0.1% and the Minmac is reported to be capable of 20 readings per second in the line mode. Resolution is one part in 1,350 at maximum scale.

The DC-19 is priced at \$11,990 which includes a paper-tape punch or a choice of interfaces to suit a Wang 700 computer, or an IBM 026 or 029 card punch.

Computer Equipment Corp. is located at 14616 Southlawn Lane.

### Systems / Peripherals

pendent computer reduction of analog/graphic data into digital form. The company said the Model DC-19 permits any analog data to be scaled and recorded on paper tape in a flexible format suitable for listing on any tape operated typewriter. It can also operate directly in conjunction with an IBM card



DC-19 Minmac Data Converter System

## TM-8 Time Division Multiplexers Interface Switched-Network Modems

WATERTOWN, Mass. — A time-division multiplexer said to be capable of servicing up to eight terminals of intermixed data speeds simultaneously from 1,200 bit/sec to 4,800 bit/sec has been announced by Codex Corp. The multiplexer, called TM-8, is designed to operate in conjunction with the Codex AE-96, 9,600-bit/sec, voice-band modem.

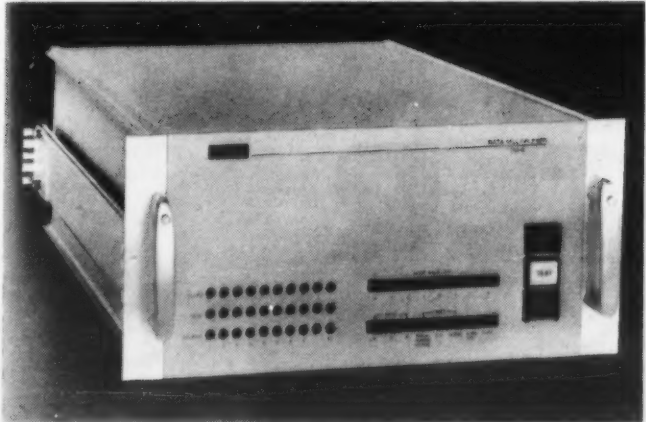
A feature of the TM-8 provides an interface between switched-network modems such as the Western Electric 202C. The multiplexer is said to be totally transparent so that EIA RS232B modem control signals are passed through the multiplexer in a way that requires no changes in system operating concepts.

Codex indicates that it expects the new multiplexer to be used in those applications where terminals operating at 1,200 bit/sec and higher must access a remotely located central computer through the public switched-telephone network.

The multiplexer provides a wide selection of channel options for commonly used data speeds, according to Codex. This permits the network designer to obtain the data speeds required for his particular terminal, Codex claims.

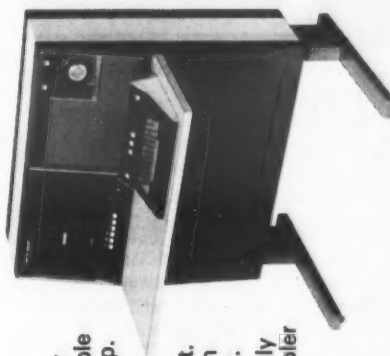
The Codex TM-8 time division multiplexer is priced at \$4,000 and is available on a 30-day delivery schedule.

The Codex Corp. is located at 150 Coolidge Ave.



TM-8 Data Multiplexer

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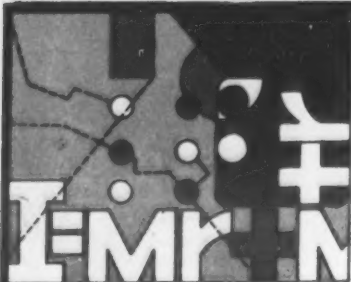


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## Calendar

March 16-18, New York — Management Seminars presents two seminars on Advanced Production Planning, Models & Systems. Also, on April 6-8. On March 18-20 and April 8-10 a seminar on Advanced Production Scheduling, Models & Systems. Contact: Management Seminars, P.O. Box 414, Caldwell, N.J. 07006.

March 16-20, Chicago — Rath & Strong, Inc. presents a five-day Management Information Systems Seminar. Contact: Seminar Department, Rath & Strong, Inc., 140 Federal St., Boston, Mass. 02110.

March 23-26, New York — The 1970 IEEE International Convention, with the theme, "Launching the Spectacular '70s." Contact: The Institute of Electrical and Electronics Engineers, Inc., 345 E. 47th St., New York, N.Y. 10017.

March 25-27, Boston — Contracting for Computer Services is a seminar providing information on the acquisition of data processing systems. Contact: NDEI, 11 Arlington St., Boston, Mass. 02116.

April 1-3, London — "Software '70" is the theme for the Software World/Sheffield University joint seminar. Contact: Mrs. S. Blackman, Software World, Morley House, 26-30 Holborn Viaduct, London, E.C.1.

April 4, Chicago — Newell E. Usher will be the principal instructor at the IBM System/360 Disk Programming seminar. Contact: Newell E. Usher Associates, Inc., 720 Enterprise Road, Chicago Heights, Ill. 60411.

April 7-9, Chicago — The National Electronic Packaging and Production Conference, "Nepcon '70 Central," will emphasize circuit packaging and production techniques involved in consumer, industrial and computer electronics. Contact: Industrial & Scientific Conference Management, Inc., 222 West Adams St., Chicago, Ill. 60606.

April 13-17, San Francisco — SofTech presents a five-day course in "Building Software Systems with AED." Contact: SofTech, Inc., 39 Totten Pond Road, Waltham, Mass. 02154.

April 17, New York — Fifth Annual Upper New York State Systems Seminar. Contact: Upper New York State Systems Seminar, H.G. Vogel, 117 Pearl St., Batavia, N.Y. 14020.

April 20-23, Detroit, Mich. — 1970 meeting of the Honeywell Users Group (HUG). Contact: Mr. D.C. Bane, Southern California Edison Co., P.O. Box 410, Long Beach, Calif. 90801.

April 21-24, Los Angeles — 23rd Annual Southern California Business Show, sponsored by the Los Angeles Chapter, National Association of Accountants. Contact: Fred Russell, 423-31st Street, Newport Beach, Calif. 92660.

March 30-April 1, Los Angeles — A computer symposium entitled Expanding Use of Computers in the 70s: Markets — Needs — Technology, sponsored by Informatics Inc. and University Extension, UCLA. Contact: Engineering/Physical Sciences Extension, 6115 Mathematical Sciences Bldg., UCLA, Los Angeles, Calif. 90024.

April 21-24, Los Angeles — 23rd Annual Southern California Business Show, Management Efficiency in the Space Age. Contact: Los Angeles Chapter, National Association of Accountants, 417 S. Hill St., Los Angeles, Calif.

# TAKE A LOAD OFF YOUR SMALL COMPUTER



## Statewide California College Computer Complex Forged With Ten CDC Systems

MINNEAPOLIS — One of the world's largest educational organizations, the California state college system, has purchased 10 CDC computer systems valued at about \$7 million.

Now being installed, the systems will comprise a network

designed to extend the length of the state, giving the colleges broader information gathering and processing capabilities in both education and administration.

Included in the complex are two CDC 3300s now operating

at regional centers in Los Angeles and San Jose. These centers will be linked with eight CDC 3150 systems to be located on California state college campuses in Arcata, Chico, Sacramento, San Francisco, Hayward, Fresno, Fullerton, and Pomona.

Additional non-CDC computers installed at some of the schools have been interfaced to the central 3300 systems.

In this way all student, faculty, and staff records from the college system's 19 campuses will be compiled and relayed by the on-site computers to one of the central 3300s for processing and storage.

In addition, the 3150s will support computer education courses and faculty research at the schools. Other applications include a wide range of student services, such as registration, classroom and dormitory assignments, and generation of grade reports. A library system designed to keep track of inventory and handle circulation tasks is also planned.

Cost analysis and general business chores will be performed by the central system, providing organization-wide reports in these areas.

Enrollment of the combined schools now stands at 240,000 with 10,000 faculty. College officials estimate that enrollment will reach the 250,000 mark by next year.

## Pace Offering 13-Subject IBM 360 Study Curriculum

ARLINGTON, Va. — Reporting an increased demand for educational services since the inception of its On-Site OS/360 program in late 1969, [CW, Dec. 24, 1969], Pace Computing Corp. has announced an expanded, 58-course, 13-subject-area curriculum in advanced 360 technology.

Called Pace-Plan '70, the approach covers four areas:

Pace-Site is a 10-course offering in systems programming to be presented during April and May at the Pace Technical Center here.

Site-Plan '70 will offer regional presentations of the Pace curriculum to meet the common educational needs of more than one firm. Pace will coordinate arrangements between companies, with charges shared among participating firms according to the number of stu-

dents from each.

Project '70 is a fulfillment plan for the machine service projected in the Pace 1970 development schedule. Presently employing capabilities in local OS/DOS batch processing, Datatext, APL, conversational remote batch entry, and remote job entry, Pace expects delivery of a 360/65 with DOS in October.

Finally, On-Site '70 is an extension of the firm's 1969 program to provide OS/360 education and support at client locations.

Commenting on the expanded services, Pace President Dr. Jack L. Stone said, "The response we have thus far received from the industry in OS/360 education has exceeded even our optimistic projections. . . . We fully anticipate providing complete services in every major area of OS/360 by the completion of Pace-Plan '70."



COMPUTERWORLD

## education

### Expanding Use of Computers in 70s Is Topic for Computer Symposium

LOS ANGELES — "Expanding Use of Computers in the 70s: Markets, Needs, Analogy" will be the topic of a computer symposium scheduled for March 30 — April 1 on the UCLA campus.

Jointly sponsored by Informatics Inc. and University Extension, UCLA, the three-day conference will attempt to identify the long-range markets that may shape information processing in the next decade.

Among the slated speakers are: Isaac L. Auerbach, president, Auerbach Corp.; Dick H. Brandon, president, Brandon Applied

Systems, Inc.; Walter F. Bauer, chairman of the board and president, Informatics Inc.; Erwin Tomash, chairman of the board and president, and Data Products Corp.; Erling Dessua, project manager, United Nations Computing Research Center in Czechoslovakia.

An Informatics spokesman said the conference would be open to all interested persons. The registration fee is \$100.

Additional information is available by writing to P.O. Box 24902, Engineering/Physical Extension, University Extension, UCLA, 90024.

#### Do You Make Minicomputers?

#### Do You Use Minicomputers?

If you make them, let CW know how, what kinds, how much they cost, and how many you make.

If you use them, let CW know how and why.

CW is planning a supplement on minicomputers and is interested in what's going on in this fast-growing area.

Reply to:

**CW Supplements Editor**  
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COMPUTERWORLD

## societies

### DPMA Backs Ph.D. Research in DP Field

PARK RIDGE, Ill. — The Data Processing Management Association (DPMA) has announced a May 1 deadline on applications for its 1970 doctoral candidate research grant program.

According to the association, a number of individual awards of \$2,000 each are made annually to candidates who perform research in preparation for doctoral dissertations in the field of data processing systems and management.

Applicants must be advanced

doctoral candidates at accredited graduate schools, and ready to devote full time to the dissertation. The doctoral committee must have already been appointed by the university and the proposed research, including content and methodology, must have been approved.

According to a DPMA spokesman, research must be directed towards methods of management, planning, control, or organization and decision-making utilizing information and com-

puter sciences.

The first \$1,000 of the grant is given at the rate of \$125 a month for eight months, during which time the candidate pursues his research. Final payment of \$1,000 is given upon completion of the study and its acceptance by the university. The dissertation must be completed within three years of the first payment.

Application forms are available from DPMA headquarters at 505 Busse Highway, 60068.

### AEDS Plans Its 8th Annual Convention for May 13-15

WASHINGTON, D.C. — The Association for Educational Data Systems (AEDS) has scheduled its eighth annual convention, entitled "Education Through Technology," for May 13-15 in Miami Beach.

Founded in 1962, the association is a nonprofit international organization for those interested in advancing education by developing a greater understanding of the impact of educational technology.

According to Program Chairman L. Everett Yarbrough, presentations at this year's conference will include: Project Control Systems, Compilers — A Comparative Review, Curriculum and Teacher Training, Oper-

ational Examples of Computer-Assisted Instruction, Test Design and Selection, APL — A New Vehicle for Computing, The Effective Use of Consultants, The Status and Future of Computer-Managed Instruction, Simulation Models and Management Information Systems, Data Processing Courses in the Secondary Schools, Administration and Computer Processing of Test Results, File Management Software Packages, Student Scheduling by Computer, Implementation of a Computer-Assisted Instruction Project, and Data Processing in Junior Colleges.

Yarbrough noted that many of the sessions will be presented concurrently, but that some would be given more than once to accommodate time conflicts. Preregistrations are "going well," according to Yarbrough, who added, "I really expect to have at least 1,000 attendees this year."

Fees for the conference are \$30 for AEDS members registered before April 30; \$35 thereafter. Nonmembers will pay \$40 for preregistration or \$45 at the conference.

Additional information is available from AEDS headquarters here at 1201 6th St., N.W., 20036.

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### Societies Shorts

#### The Magnificent Machine

PARK RIDGE, Ill. — A new, 16mm color film entitled Man's Most Magnificent Machine has been released by the Data Processing Management Association (DPMA).

The film explains the function of computers, tells about the jobs of those dealing with systems, and discusses the growing impact of data processing on American life. It is said to be nontechnical and is directed at general audiences at the junior high school level and up.

Copies of the 20-minute presentation may be borrowed without charge from the Conference Department at DPMA Headquarters, 505 Busse Highway.

#### McQuillin Decus President

MAYNARD, Mass. — Richard J. McQuillin of Information International, Inc., Boston, has been elected 1970 president of the 6,000-member Digital Equipment Computer Users Society (Decus).

McQuillin noted that part of his efforts would be directed at closer coordination between American and European members. The Decus European committee includes representatives from England, Switzerland, Holland, Sweden, and Germany.

Also elected were John C. Alderman of the Georgia Institute of Technology as meetings chairman and Dr. Daniel M. Forsyth, Information International, as recording secretary.



# IBM SYSTEM/360 DOS AUTOMATIC COMPUTER UTILIZATION SYSTEM

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## Presentation Schedule

### MARCH

CLEVELAND - MONDAY, MARCH 9  
DETROIT - TUESDAY, MARCH 10  
ST. LOUIS - THURSDAY, MARCH 12  
HOUSTON - FRIDAY, MARCH 13

### APRIL

LOS ANGELES - MONDAY, APR. 13  
SAN FRANCISCO - WEDNESDAY, APR. 15  
SEATTLE - FRIDAY, APR. 17

### MAY

PITTSBURGH - MONDAY, MAY 4  
INDIANAPOLIS - TUESDAY, MAY 5  
KANSAS CITY - THURSDAY, MAY 7  
MINNEAPOLIS - FRIDAY, MAY 8  
TULSA - MONDAY, MAY 25  
DALLAS - WEDNESDAY, MAY 27  
PHOENIX - THURSDAY, MAY 28

### JUNE

PORTLAND - MONDAY, JUNE 15  
SALT LAKE CITY - WEDNESDAY, JUNE 17  
DENVER - FRIDAY, JUNE 19

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# Ampex Claims Unique Approach to Customer Training, Cites Results

By a CW Staff Writer

CULVER CITY, Calif. — A unique approach to industrial education has reduced average training time by 35%, increased service engineering skills of trainees by as much as 25%, and is earning back much of its own expense.

The "class of one" approach is enabling Ampex, a manufacturer of computer peripheral equipment, to offer customers broader training resources that support the organization's sales efforts.

A typical class of 11 at the Computer Products Learning

Center in Culver City (where most customers undergo the training) quickly becomes 11 classes of one as some students take seats at individual carrels, put on earphones, and adjust cassette tape players.

Another enters a private projection room to view a pre-recorded video tape or a movie.

Yet another sits down at an audio tape system that takes him through a branching-type learning session much as a human instructor would.

The key is that each man is receiving a study sequence that

has been individually programmed to meet his specialized needs. The curriculum for his "class of one" has been constructed from a broad range of learning modules prepared by professional educators of the Learning Center staff.

According to Ampex, modular learning approach has these advantages:

- It can be adjusted precisely to the student's interests.
- It lets the student learn at his own pace, not that of a group.
- It makes it easier to vary the

media of presentation, needed to sustain maximum interest and to teach each subject in the very best way.

• It provides more time for "hands on" study of Ampex magnetic tape drives and core memories than would group teaching.

The Learning Center's primary purpose is to train service engineers from customer companies in the operation and maintenance of Ampex digital tape drives and core memories.

## Individual Learning

Individualized instruction, teaching each student only what he needs to know at his own pace, and allowing maximum time for "hands on" equipment study are the main advantages of the "class of one" approach.

Curricula of the Learning Center includes description and operation of Ampex TM-7, 9, 11, 12 and TMZ tape memories, on video tape and using actual equipment; instruction in power supplies, control logic, servo systems and data electronics, presented by cassette tape and

technical manuals; basics of core memories, on film and audio tape; course on manufacture, care and handling of magnetic tape, presented by color slides with sound-synchronized taped narration; and videotape recordings explaining the IBM 360 system used at the Ampex computer products division here.

## Lecture Replayable

Once preserved in a learning module, a lecture or demonstration becomes permanent. It can be replayed to students indefinitely as long as there is no change necessitated in the lesson material. Even if that happens, those presentations which are on magnetic tape or slides may be updated if the change affects a relatively small part of the presentation.

All course materials are available at the Culver City Center or they may be purchased by customer companies for unlimited use at the customer's training facilities. Seven Companies have already purchased such learning packages this year.

## 'Space Odyssey' Co-author Receives Computer From Science-Fiction Fans

PALO ALTO, Calif. — Science fiction fans who work for Hewlett-Packard Co. here gave one of their idols an extra-special present — an HP 9100A computing calculator.

Arthur C. Clark, noted science-fiction writer and co-author of the movie "2001: A Space Odyssey," was the recipient of the \$4,400 machine after having a "Christmas wish" printed in the American Airlines passenger magazine.

A Hewlett-Packard spokesman said that some employees noticed Clark's wish among those of other "celebrities," and so they took up a collection of fellow readers and movie fans, and presented the computing calculator to the author.

Clarke, who lives in Colombo,

Ceylon, received special permission from his government to import the item, whose value far exceeds the legal limit of \$140 for such gifts.

He has reportedly offered to make the machine available to the Ceylonese Institute of Scientific and Industrial Research.

## Computer Solves Handicaps

FARMINGDALE, N.Y. — Sports Computer Corp. has developed a computer, Golf Handy-Capper, that will possibly revolutionize the problem of handicapping.

The computer, which will be leased to a club for less than \$1,000, will enable a golfer to determine his handicap strokes in seven seconds after each round.

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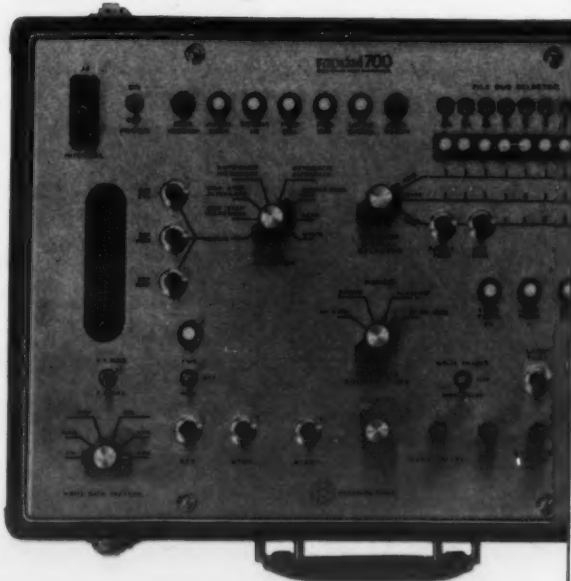
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- Systems Analyst Training
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Artur Herrdum KG.  
4000 Duesseldorf  
Grafenberger Allee 68  
West Germany



March 11, 1970

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# Industry Revenue Rises 17% to \$10.1 Billion in 1969

NEW YORK — Computer companies based in the U.S. rang up \$10.1 billion in revenue in 1969, a rise of 17% from 1968, even though the value of computer equipment shipped remained level at about \$7 billion for both years.

This report was made last week at the Plaza Hotel to a seminar for the investment community sponsored by International Data Corp., the largest data gathering, analysis, and publishing company in the computer industry.

IDC also reported that:

- Revenues for the computer

industry are expected to increase by 18-20% annually for the next five years, reaching an annual level of \$24.4 billion in 1974.

- IBM's share of the value of equipment shipped last year declined more than 3% to 69.2%.

Patrick J. McGovern, president of IDC and publisher of *Computerworld*, said the paradox in 1969 of sharply increased revenues for the industry on level equipment shipments is a result of the growth of the non-equipment segments of the industry — especially software, time-sharing, and education.

IDC said almost 70,000 general-purpose computers worth \$29.5 billion were installed worldwide at the end of 1969.

Within the U.S., McGovern said, a total of 61,000 computers were installed, of which 46,000 are general-purpose and 15,000 are dedicated-application computers.

He added that almost 87,000 computers of both types worth \$31 billion have been installed worldwide. "Of that number, 69,400 worth \$29.5 billion were general-purpose machines and

17,500 worth \$1.5 billion were dedicated-application machines."

McGovern feels the computer industry is well into a transition period as third-generation equipment lines, introduced in the mid-1960s, "reach a mature point in their product life."

As a result, he noted, a higher percentage of 1970 shipments will be additions and upgrades to existing systems as users wait for the manufacturers to introduce new lines of equipment.

Because of this and other factors such as unbundling, IDC predicts only a slight increase in the value of hardware shipments this year. After that, the total value of shipments is expected to increase by about 12-17% yearly through 1974.

By 1974, IDC forecasts, there will be approximately 250,000 computers made by American companies installed worldwide worth \$68 billion.

IDC listed the percentage of the worldwide installed value of computers in 1969 of the major American manufacturers as: IBM, 70.5%; Univac, 6.7%; Honeywell, 4.2%; CDC, 4.1%; GE, 4.0%; RCA, 3.6%; Burroughs, 3.2%; NCR, 2.4%; XDS, 0.8%; and DEC, 0.2%.

Looking at other segments of the computer industry, McGovern reported these changes in revenue:

- Independent peripheral sales, including terminals, increased 21% last year to \$435 million. Growth is expected to rocket about 30% this year.

IDC gave the percentage of worldwide dollar shipments of computer equipment of the major manufacturers in the last two years as:

	1969	1968
IBM	69.2	72.7
Univac	5.6	5.3
Honeywell	4.7	4.1
Burroughs	4.2	2.9
GE	4.0	3.5
CDC	3.6	4.2
RCA	3.2	3.6
NCR	2.7	1.5
XDS	1.0	1.0
DEC	0.8	0.5

- Computer supplies, including tape and disks, accounted for \$1.1 billion in revenue, a 12% increase from last year. A 12% increase is anticipated this year.

- Computing and data processing services, which includes service bureaus, on-line batch, remote access/immediate response, and time-sharing, derived revenues of \$940 million in 1969, up 31% over 1968. Of this, conventional batch service bureaus had about a 25% growth rate while on-line computer services grew by over 67%. This year's growth is expected to be about 28%.

- Independent software suppliers showed the greatest relative revenue increase last year, raising their income 66% to \$450 million. As unbundling becomes effective this year, a 55% rise is expected.

## Global Communications Market Urged; 'Transcends Narrow National Interests'

PARIS — Robert W. Sarnoff, chairman and president of RCA Corp., has called for the creation of a global common market of communications that would transcend narrow national interests.

"Failure to act promptly on a common global communications policy could result in chaos and cost the nations of the world at least \$100 billion yearly over the next decade in unrealized national development, in unfulfilled opportunities in business and trade, and in unsatisfied social goals," he said.

Speaking before a joint meeting of the American Chamber of Commerce in France and the American Club of Paris, Sarnoff noted that governments still tend to regard communications as "an instrument of national policy at a time when technology is turning it into a global resource by overcoming limits of speed and capacity."

As an example, he cited the failure to develop a unified global approach to satellite communications.

"If this new device is to realize

its full potential," he said, "the nations of the world must come together to agree on matters of frequency, rates, copyrights, avoidance of interference, and freedom of access to the system's facilities."

"Here again, however, representatives of the world's nations appear to be competing more for national or at best for regional or bloc advantage than cooperating for global progress."

### Warns of Widening Gap

Charging that the widening gap between the world's communications potential and its sense of community is aggravating international tensions, Sarnoff said the proper development and use of the new technology could move nations toward greater cooperation and progress and stimulate growth in all countries.

To that end, Sarnoff proposed the following:

- A study and appraisal of the global capabilities of communications and the innovations that can be expected in the near future.
- On the basis of these find-

ings, development of a systems approach to shape world communications that are open, adaptive, and growing to meet new opportunities.

- A specific cooperative project, either on earth or in space, to inaugurate a new era of truly international communications.

As a possible project, Sarnoff suggested a coordinated study of satellite communications using visible and infrared wavelengths, which offer virtually unlimited channel capacity.

"As the nations with the most advanced space programs, the United States and the Soviet Union should take the lead in developing such a project and offering it for cooperative experimentation by all countries," he said.

He urged cooperative action by national governments to undertake the three-stage program with the help of experts in international agencies and university and industrial groups in the various countries.

"The result could be a global common market of communications, embracing all countries of the world," said Sarnoff. "This new entity would reject communications nationalism as decisively as members of the European Common Market and countries of the outer seven have rejected economic nationalism."

"With continued expansion of channel capacity, it would foster an increasing worldwide flow of information that would bring benefits as tangible as the increasing trade among the countries of Western Europe. The distribution of knowledge by such a system would provide a greater stimulus to growth than any conceivable program of economic aid."

## Univac's Federal Systems Division Forms Marketing Support Dept.

ST. PAUL, Minn. — Sperry Rand Corp.'s Univac Federal Systems Division has formed a new systems support marketing department under John McAllister, Jr.

In making the announcement, Dewaine L. Osman, director of defense systems marketing, said the company's aim is "to provide the Federal Systems Division with a single organization for the coordinated marketing of

software and system support to the U.S. government.

"The new department," he added, "will offer coordinated software and system support to both the defense and data processing systems marketing organizations."

McAllister was formerly manager of the division's data processing systems marketing branch office in Huntsville, Ala.

## Cambridge University Uses DEC T/S

CAMBRIDGE, England — The first European installation of DEC's small computer-based, general purpose time-sharing system is being used primarily for student operation at Cambridge University, according to the company.

Designated TSS-8, the system is built around the PDP-8/I, one

of DEC's family of eight bit word minicomputers.

Although a wide variety of languages are reportedly available for use with the TSS-8, Cambridge students will do the bulk of their work in the DEC developed conversational language Focal.

Focal enables the user to modi-

fy his program line-by-line or, even a character within a line and to make changes in data during an experimental sequence. Each student has control over his experiment, using a program of his or his instructor's design. For testing, the instructor can withhold data from students.

## COMPUTER EQUIPMENT FOR SALE

IPS has the following equipment for sale from its own inventory:

- 360/20 8K Card System with 2501 Card Reader, 2203 Printer, 2560 MFCM in February, 1970.
- 2311 Disc Drives in February, 1970.
- 2841 Disc Control Unit in February, 1970.
- 2401-3 90KC Tape Unit immediately.
- 1401 C-3 System with 1402, 1403 II immediately.
- 7330 Tape Units (three available) immediately.

For prices and specifications, please call or write.

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## Infotec Buys Communications System

PLAINVIEW, N.Y. — Infotec Inc. has acquired a patent for a new systems technology which provides the key to a low-cost, rapid-retrieval total communications system, according to company President George Wulfin.

The system is designed for major computer users with multiple long distance branch outlets.

Infotec acquired a patent for a "data handling system and method" from DigiCorp., Plainview, N.Y., in exchange for Infotec common stock, says the company.

Communications problems

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such as credit checking, balance verification in branch banking, message switching, and data communications will reportedly be solved faster and less expensively using Infotec's system, which can transmit from buffered terminals or tape transport over voice-grade telephone lines at 300 char/sec.

The system is designed for rapid transmission of messages or inquiries to the computer without requiring the operator to wait for line connections through the central station.

"With this new system technology, we can solve a major business communication problem of the large multi-plant corporation," and Wulfin.

"We can now configure a total communication system for the major computer user who must

answer many inquiries from many locations very quickly through one central computer," he said.

Rather than individual direct long distance lines to an unlimited number of remote terminals connected to the computer using expensive communications switch gear or data multiplexers, stations can be connected to a central computer, says Infotec, via one transmitter-receiver interfacing to the loop. A buffer is said to store the inquiries and pass them at high speed through the loop without disrupting the operator.

Features of the system are reportedly its full utilization of the lines connecting the various inquiry stations, and its handling of more than one inquiry and response per inquiry station.

## Trade Shorts

Hewlett-Packard Co. of Palo Alto, Calif. has consolidated two operating divisions into a new division for the production and marketing of automatic electronic measuring systems.

The new division represents a merger of the HP Systems Division, which manufactures and markets custom-designed instrument systems, and the Palo Alto division, which produces data acquisition systems.

Univac plans to combine its Philadelphia-based commercial field marketing and customer service organizations of both the present DP division and the Information Services division, says R.E. McDonald, company president.

Digital Development Corp. of San Diego now offers a full-time regional marketing service in St. Louis.

Field support service for the magnetic tape transport system, Compu/Corder, manufactured by Sykes Datatronics Inc., will be provided nationally by UCC's System Support division, under an agreement announced by Alexander Schobel, sales vice president, in Rochester, N.Y.

Computer Systems Technology (Comstec) of Jenkintown, Pa., has been awarded the exclusive licensing agreement to sell an on-line computerized Central Information File System (CIF) to the financial industry by American Fletcher National Bank of Indianapolis.

The CIF System enables bank officials to obtain an immediate summary of a customer's relationship with the institution, such as checking accounts, savings accounts, mortgages, and commercial loans. Information is accessed by simply typing the customer's name on a CRT terminal.

Atlantic Technology Corp., Somers Point, N.J., has contracted Redmar Assoc., Needham, Mass., as one of its manufacturer representatives. The contract completes a national marketing network for the ATC Data Display Terminal and custom display systems.

Levin-Townsend Service Corp., New York, and Sigma Data Computer Corporation, Bethesda, Md., have agreed to a plan whereby LTS will participate in the marketing of Sigma Data's Inquiry and Reporting System throughout the U.S. and Canada.

Sigma Data's reporting system is an advanced general purpose information management system.

Input Output Computer Services Inc. is now devoted exclusively to the software problems of PDP-8 users. Until now, the Cambridge, Mass.-based company has provided programming support on systems applications involving a variety of large and small scale computers, says president Thomas A. Farrington.

ITS, a Minneapolis-based computer services firm, has closed its San Diego, Calif. sales office. ITS feels that long-range revenue projections do not justify facility maintenance, but said personnel will be relocated in branches at Los Angeles and San Francisco.

Softech Inc., Waltham, Mass., according to its founder and president, Douglas T. Ross, has been awarded a one-year contract by the Air Force to distribute, maintain, and enhance the Automated Engineering Design (AED) software system. AED was released for public use last July with Air Force and industry sponsorship by the Computer Applications Group of M.I.T.'s Electronics Systems Lab.

Comp-Serv, Los Angeles, has named Harvey J. Drasner Associates to represent them in the metropolitan New York and northern New Jersey areas.

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Both use the XiOX "Sav-A-Matic" package, which is the result of thousands of man-hours of work by experts. Sav-A-Matic is programmed in cobol for IBM 360, RCA SPECTRA 70, and Burroughs 3500 and 5500 systems, with every facet of processing, accounting and management information reports for C.D., T.D., Open Account and Regular Savings.

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One of the larger banks in the country, with assets in excess of \$1.1 billion, uses XiOX financial software.

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how to do its own programming. And just as obviously, Continental National has to budget with a sharp pencil.

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System Description	A	B	C	D
	Basic Unit Processor	Basic Unit Processor with Faster I/O	Unit Processor with Multi-Programming	Pre- Processor
C.P.U.	1108	1108	1108	1108
Software	Exec II	UCC Exec	Exec VIII	UCC Exec
Memory	65K	65K	131K	65K
Front-end Processor	None	None	None	COPE Controller
I/O (Peripherals)	Univac	COPE	Univac	Univac
Maintenance	Univac	UCC	Univac	UCC

Your system  
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**Hardware:**

1108 Central Processor  
65K or 131K Core Memory  
VIII C Tapes  
Fastrand II  
FH-432 Drums

**Software:**

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Exec VIII  
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COPE Controller  
COPE Printers—240 to 1250 lpm  
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# Computime's 360/85 Heart of UK, European Network

Special to Computerworld

LONDON — Computime, a computer time broker, plans August delivery of an IBM 360/85 to be the heart of a computing network planned as a remote batch processing service for commercial and scientific users in the UK and Europe. This machine replaces Computime's present 360/50, which went on-line last July.

The company has just added two new Memorex 630 disk drives to this system which will be retained in the new installation.

Cost of the 360/85 is about \$8.4 billion and Computime will rent at \$156,000/mo. Commenting on this, Max Lipman, managing director of Computime, said that depending on the job being processed and the configuration of each machine, the Model 85 is 14.7 times as fast at only 3.5 times the cost. Present customers should also find some savings in costs when transferring their work to the larger machine, Lipman added.

Although the new system is primarily intended as a central machine for a remote batch processing service, customers' jobs will still be handled at Computime's Oxford St. premises. The system is capable of being linked to 50 high-speed terminals.

Additionally, Computime plans to open regional offices throughout the UK equipped with terminals for clients not wanting to have a terminal of their own. About five offices are expected to be operational by the end of this year and double that number by the end of 1971.

Computime claims that the machine will be the first of its kind in Europe and the most powerful configuration in Europe to provide time commercially.

The 360/85 will be composed of a central processor with 1,024K bytes of core store, six 2311 disk drives, two 2314 multi-disk units, a 2301 high-speed drum with a capacity of four million byte/sec, eight 2401V magnetic tape units with a transfer rate of 120,000 byte/sec, and seven 2401 III magnetic tape units with a 90,000 byte/sec transfer rate. The lineup of other peripherals includes 2260 visual display units, punched card and paper tape input/output units,

and line printers.

The operating system, Lasp/MVT, (Local Attached Support Processor) is a section of the central processor which selects jobs from the job queue and is said to allocate the required peripherals, giving optimum operation and efficiency.

A two-level service will be organized for the remote batch processing. One, a priority service, will have a turn-around

time of 15 minutes and the other, as standard, gives a two-hour turnaround service.

New customers will initially utilize the Post Office Datel 600 service operating at 600 baud and the public service to connect with the central computer, but they will subsequently be given private 2,400-baud working leased lines. When the modems become available, they will then be able to move to 4,800-baud

operation.

Computime claims to be at an advanced stage of negotiations with an alternative company to IBM, for the supply of card reader and line printer terminal equipment, although Lipman said it was his policy to supply IBM equipment to those customers who requested it.

Plans are progressing for Computime to either rent or sell the alternative terminals to users of

the service. The company also revealed plans to market them independently. These terminals are reportedly cheaper than the IBM equivalents and, according to the company, it is likely that they will be offered at 20% less than the IBM 2780. A Computime customer who bought one would only be charged for connect time to the central processor, on-line storage, and the use of peripherals.

## Sanders can throughput more input...

### NETS Uses Microwave Relay Transmission

National Electronic Transmission Service (Nets) has been formed to provide general data processing service using microwave relay transmission.

Nets will maintain headquarters in East Tawas, Mich., and will initially offer full service on-line bank data processing service in a four state area, including Michigan, Illinois, Wisconsin, and Minnesota.

The firm plans to use NCR Century 200 computers at its initial locations to service the four states, with additional central processing locations to be used in its plan for nationwide expansion.

**Mistake?** It probably hit you right where you live. Error-free input is the life blood of any EDP man.

That's why Sanders designed a system that gets input moving, yet keeps it error free. The Sanders System 6000\* Display Data Recorder.

The operator taps a key. Instantly, a replica of the source document—we call it a format—appears on the screen. Then the operator simply types information into the blanks. Logically. In the same

order and position as on the original. Notice how the System 6000 displays data in two intensities. It makes it easy to verify. Errors are corrected by simply overtyping. Text automatically adjusts for insertions and deletions.

Once all the data is correct—and only then—the operator enters it on computer-compatible tape. Up to twelve units can share the same reel, so tape pooling is eliminated. And the operator can select many formats from a changeable tape cartridge.

If you don't look at the system that can throughput more error-free input, you're making a mistake. Any way you spell it. Call your nearest Sanders sales office, or contact Marketing Manager, Data Systems Division, Sanders Associates, Inc., Daniel Webster Highway S., Nashua, New Hampshire 03060. Or call (603) 885-4220.



\*TM Sanders Associates, Inc.

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## Computerminal Signs \$60 Million Pact To Buy 40 B5500s From Burroughs

By Phyllis Huggins  
CW West Coast Bureau

SAN FRANCISCO — Computerminal Inc. has signed contracts with Burroughs Corp. for \$60 million in computers, representing the largest commercial order ever placed outside of the U.S. Government.

The order is for 40 dual processor B5500s that will be

installed in 20 major cities throughout the U.S.

Supporting the B5500s will be 30 or 50 terminals for each center, which will be installed on the customer's site. A contract for some \$64 million in terminals is currently being negotiated. The application will be remote batch with the marketing target the replacement of IBM's

existing small to medium computers.

"We will replace the customer's computer with a high-speed on-line terminal with card reader and printer that is probably twice as fast as those the major manufacturer has on the market now," said Len Palmer, company president.

## Contracts

Computer Corp. of America, Cambridge, Mass., has leased its Model 102 information retrieval software system to Systemation, Inc., a Boston consulting firm, on behalf of the Department of Public Health of the Commonwealth of Massachusetts. The system will be used to keep track of statistical and operating data on the state's health care units, including nursing homes,

hospitals, and laboratories.

The visual display portion of a computerized system that will accept live test information from in-flight aircraft, process the data, and enable ground-based engineers to respond while the aircraft is still aloft has been delivered to Xerox Data Systems by Sanders Associates, Inc. of Nashua, N.H. Under the contract, Sanders installed five Adds/900 systems including function generators, CRT displays, keyboards, Photopen devices, and special interface equipment.

Precision Instrument Co., Palo Alto, Calif., was awarded additional contracts in excess of \$400,000 to supply its Airborne Analog Recorder/Reproducer to the Lockheed-California Co. This unit, designated the An/aqh-4 (V), has 14 channels for either direct or FM recording/reproducing which are interchangeable within any recorder or between recorders. Lockheed-California Co. utilizes the An/aqh-4 (V) in the P-3C ASW aircraft system.

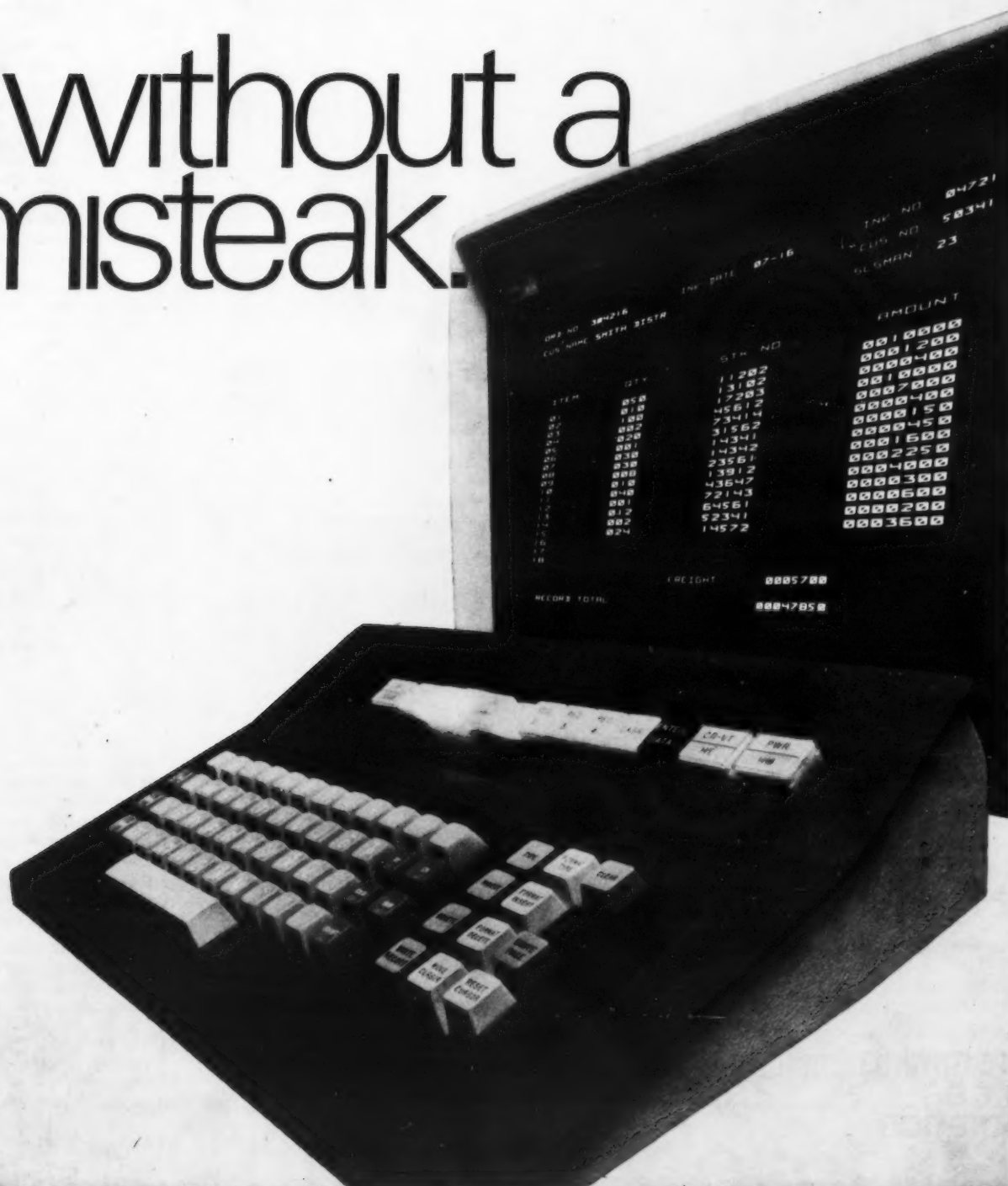
Ikor Inc., Burlington, Mass., received a contract from the Bristol Division of The American Chain and Cable Co., Waterbury, Conn., for furnishing equipment for computers used in the process industries. Amount of the contract is \$330,000.

Mobark Instruments Corp., Sunnyvale, Calif., has received contracts for more than \$384,000 for incremental digital magnetic-tape cassette recorders from Eldorado Electrodata Corp. of Concord, Calif. The order calls for several types of Mobark digital recorders and reproducers to be incorporated in Eldorado's line of computerized data terminals and other peripheral systems.

Digital Development Corp. has received a follow-on production contract close to \$1.5 million for its DDC 73-02 series digital rotating memory systems from Inventory Management Systems Inc., Los Angeles. The devices are being utilized in a new electronics system which promises to revolutionize the speed and accuracy of the customer check-out flow in supermarkets; as well as store inventory cost control.

Infodata Systems Inc., Webster, N.Y., has received three new contracts totaling \$50,000. The first contract, for a \$22,000 Inquire package of software programs, is from Grumman Data Systems, of Bethpage, Long Island. Grumman Data Systems will use Inquire with a marketing file of information on all government contracts, but primarily those for defense. The U.S. Office of Education entered into a second agreement for \$30,000 with Infodata, whereby the office's accounting system will be converted by Enquire programs from an RCA 3301 computer to an IBM 360/65. Infodata's third new contract is a follow-up order of \$6,000 from Esso Production Research Co. on an original package used by Esso Mathematics and Systems, Inc. to search petroleum literature.

# without a mistake.



## 'Galaxy' Studies Astronomical Photos

By J.H. Bonnett

CW European Correspondent  
EDINBURGH, Scotland — A completely automatic system handles the examination and analysis of astronomical photographs at the Edinburgh Royal Observatory.

The system, designated Galaxy, is coupled to a Schmidt 16-in. telescope and an ICL 4130 computer. Galaxy saves years of manual effort, and is faster than a semi-automatic system now in use at the Lick Observatory and the Naval Observatory in the U.S.

Initial results from use of the Galaxy system are spectacular.

Prior to an analysis of photographs of the constellation of Pegasus only 15 young stars, less than 28 million years old were known. Now the observatory

claims to have discovered 1,103 such stars.

The idea for a Galaxy system was conceived five years ago by Dr. P.B. Felgett, now professor

of cybernetics at Reading (Berks) University. Manufactured by Paul Coradi, Scotland Ltd., Galaxy is expected to sell for about \$264,000.

## Hayden Leases 1,000th Autoflow

NEW YORK — The one thousandth Autoflow package produced by Applied Data Research Inc. has been installed at Hayden Stone in New York. The package, which produces two-dimensional flowcharts for documentation and debugging, is being leased by Hayden.

Hayden Stone, an international stock broker, is using the product in conjunction with its two IBM 360/50s, two IBM 360/60s, two Univac 418s, and an IBM 1410 computer. It was leased for

a three-year period and is being used to document programs in a number of languages, including Cobol, Compress/Cobol, PL/1, 1410 Autocoder, and Basic Assembly.

Autoflow is the first proprietary program created by any software company to reach this or a comparable marketing level, ADR said in announcing the installation last week.

Hayden anticipates increased attention may now be devoted to more vital EDP assignments.

## Orders and Installations

Microsystems International Ltd. has placed an order for a \$2 million Univac 1106 computer system to be installed at its manufacturing complex in Ottawa, Ontario. It will be used to develop a complete management information system, including extensive on-line production information data. The Univac 1106 will make use of Uniscopes 100 CRT devices to provide critical on-line production control data for the manufacture of thin film and integrated circuits.

In anticipation of an increase in its workload and membership, Bergen County Clearing Association in Paramus, N.J., has ordered a Burroughs B500 to clear

and sort the daily checks for its 39 member banks.

A \$1.2 million Burroughs system was ordered by Florida's Department of Law Enforcement to accelerate the control of crime throughout the state. A large scale Burroughs B3500 and its data memory banks will be used to accept inquiries from, and relay information to 280 teletypewriters and video-display terminals located at police departments and sheriffs' offices throughout Florida.

The University of Brussels in Belgium has ordered a Control Data 6400 to process its administrative management information, provide computer training for students, and cover a wide range of scientific research. The system will be used either at the computer center or by means of terminals. A Control Data software package, Intercom, will be used to control this remote terminal activity.

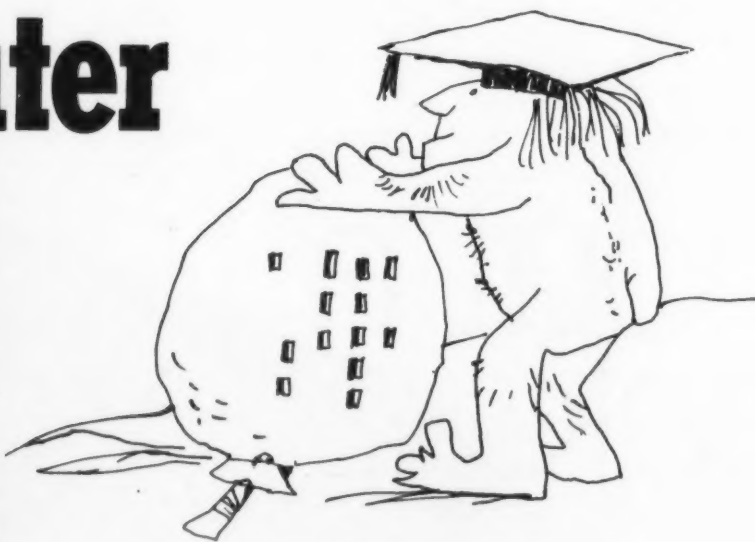
Kesko Oy, Helsinki, Finland, has installed a second Univac 494 real-time system, valued at \$1.6 million. Primary applications for these dual computers will be for inventory control, order processing, warehouse operation, purchasing, statistical work, and forecasting. Hokkaido Electric Power Supply Co., Sapporo, Japan, has installed a Univac 494 at the same price. Its system will be used for revenue, payroll and property accounting, and miscellaneous engineering and technical applications.

A system designed to offer each customer management information services, business data processing, and a variety of scientific programs, will be installed at Data Industries Inc., New Orleans, La. by Control Data Corp. The CDC 3300 will provide remote processing services through a variety of terminals, including CDC 200 user terminals to be located in customers' offices. The U.S. Army Personnel Information Systems Command has installed its second CDC 3300 to support personnel data processing projects.

A \$270,000 FR-80 computer output microfilmer (COM) was delivered to Computer Micrographics by Information International, both of Los Angeles. This is the second of three FR-80s ordered from Information International by Computer Micrographics. The FR-80 converts digital data on magnetic tape directly to graphic and alphanumeric images on microfilm, rather than on paper. It is faster than plotters or line printers, which record on paper from the same digital output.

Datacraft Corp. of Fort Lauderdale, Fla., received a \$3.4 million initial order from Recognition Equipment Inc. of Dallas, for 60 DC 6024/3 computers. The DC 6024/3, a 24-bit general purpose computer with a full cycle time of 1  $\mu$ sec, will be used as the central processor in Recognition Equipment's current line of OCR products, including the Electronic Retina Computing Reader and Input 2 systems.

# your computer wasn't raised to be a teacher



Number 1 didn't intend their computers to be used for anything but data processing. And, occasionally, for communications. It's too expensive for training computer console operators.

That's why we built our **EDUPUTER**, an IBM System 360/30 Console Simulator. It has the same lights, switches, markings, dials as the 2030 console. But it doesn't compute. You buy it, once. It's yours. To use over and over again. To train as many operators as you want. Without requiring a computer.

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After all, if you really want to produce as many professionally trained console operators as you need today, why should you have to wait for next year's budget approval?

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An entirely new class of software?

**“With CULPRIT  
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It’ll be as  
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CULPRIT (CULL and PRINT) is the first of a new class of software. Think of it as a report utility. The concept has been used only rarely before and never with the tremendous versatility of CULPRIT.

If you've been considering the use of any kind of report generator and information retrieval system, you're thinking in the right direction. But beginning today, anything you might have looked at is woefully out of date!

Many report generators can produce only one report from one pass of the data file. Others produce a Cobol program which must be compiled, link edited and run before they produce a report. Some even have both problems. That's Model T designing!

CULPRIT is a parameter-driven program. No compiling needed. The program is kept on the core image library like a utility and produces a report as directed by the parameter coding. Highly efficient, it produces many reports (up to 99) with a single pass and can extract from multiple input files.

CULPRIT requires from 1/10 to 1/40 the normal coding time. This means that the most junior-level programmer can request and get a simple one-time report in minutes. Or many complex reports in one pass... with just a few hours of coding. Not weeks. Hours! But fast reports are not all new CULPRIT can do for you.

**New Systems:** When you design a new system, how much of it is made up of report editing pro-

grams? Half? A third? Then you can put your new system on the air nearly one-third to one-half sooner by simply plugging new CULPRIT into the system to handle the reporting requirements. You not only save programming time, but the machine time usually needed for debugging this part of the system.

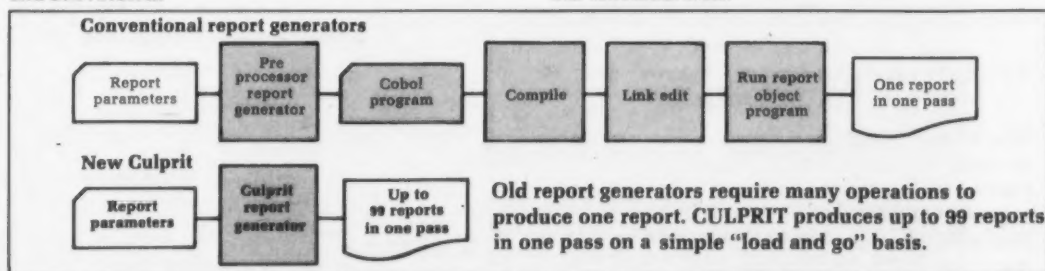
Processing speeds are close to those for well-designed and laboriously hand-coded programs. Remember... this isn't an ordinary report generator. You just load and go.

**Features:** CULPRIT has multi-line output for address labels, notices, etc. Other options include header variables; multiple-lines in headers, detail and totals; separately specifiable total lines; calculation ability on both detail and total levels; use of mnemonics for working fields; and many others. Output may be printer, punched cards, tape or disk... permitting program and test file creation and conversion.

**Development:** CULPRIT was designed by Gilbert F. Curtis and Anna Marie Thron. These are the same people who designed, implemented and installed some of the most successful application systems ever produced... systems now in use by many scores of major corporations.

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## Acquisitions

University Computing Co., Dallas, has recently acquired Computer Industries, Inc., Sherman Oaks, Calif. Computer Industries was previously a subsidiary of University Computing.

Computing and Software, Inc. of Los Angeles has acquired The Title Insurance Co. of Idaho, Boise, Idaho, in exchange for an undisclosed number of shares of common stock. Computing and Software is engaged in the management and operation of computing centers and their application in the field of specialized information exchanges. The company is also involved in computer software development, sale of computer-related marketing and financial services, data processing training courses, and the manufacture of components for the computer peripheral equipment market.

KBM Data Systems, Inc., Atlanta, Ga., a computer service company that has perfected and

begun nationwide operation of an on-line, real-time computer information system for stockbrokers, has acquired Computer Controls Corp. of Miami, Fla., for an exchange of a combination of stock and convertible debentures.

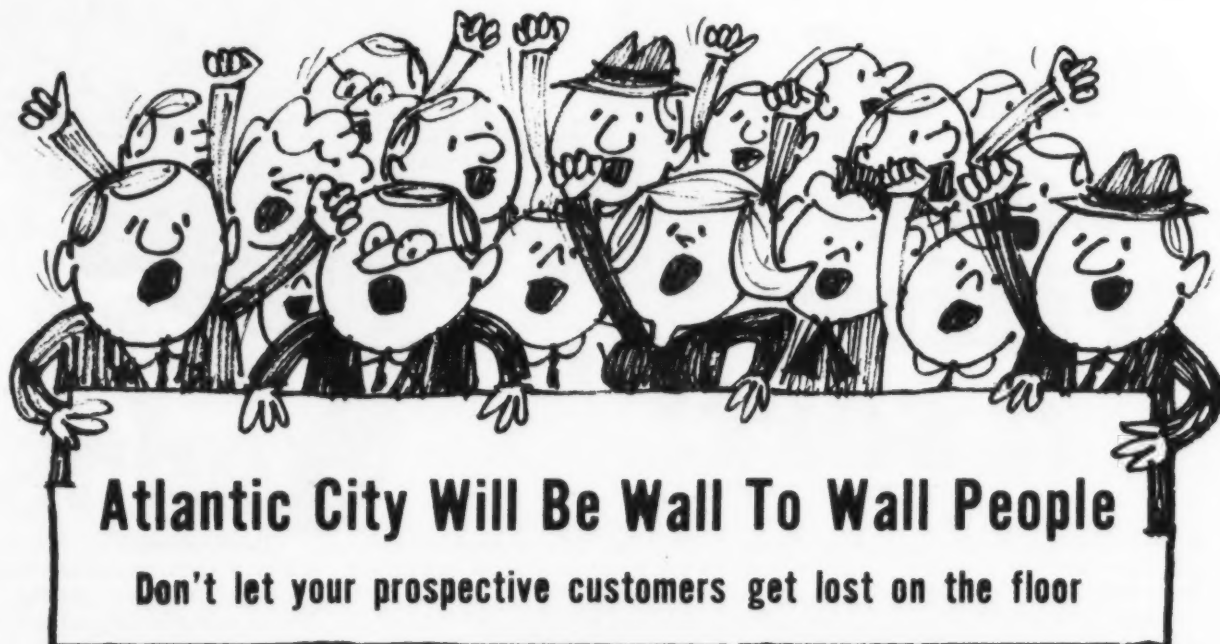
Computer Data Enterprises, Inc., Jenkintown, Pa., has signed an agreement in principle to acquire Brodsky, Hopf & Adler Technical Services, Inc., specialists in air terminal design and planning, for an undisclosed amount of CDE stock. CDE furnishes both facilities management and total data processing systems for industry and commerce with concentration in the air-transport industries, as well as proprietary software packages, time-sharing systems software, and medical consulting systems engineering.

Computer Services, Inc., Salem, Mass., has acquired Sports Data of New York, N.Y.,

a company that provides golf handicapping and billing services to country clubs.

The Girard Co., Bala Cynwyd, Pa., the parent company of the Girard Trust Bank, has purchased National Computer Analysts, Inc., Princeton, N.J., a software service company, for \$300,000 5-1/2% subordinated debenture bonds, convertible into NCA common stock at \$4.20 per share. In addition, The Girard Co. also received a warrant, exercisable at any time prior to Feb. 1, 1973, to purchase 200,000 shares of NCA common stock at \$8.40 per share, and a warrant, exercisable at any time prior to Feb. 1, 1975, to purchase an additional 200,000 shares of NCA common stock at \$9.45 per share.

Data World Corp. of Los Angeles has agreed to merge with Bubble Up Delaware, Inc. The name of the new company will be Bubble Up Industries, Inc.



Spring Joint this year, May 5, 6, 7 in Atlantic City, New Jersey, has got to be the biggest ever. More customers, more visitors, more exhibitors (bigger than FJCC — Las Vegas, if you can believe that).

COMPUTERWORLD, as always, will be right on top of it with 2 Special issues.

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SJCC Preview issue — Advertising forms close April 17  
 Color forms close April 10

SJCC Show issue — Advertising forms close April 24  
 Color forms close April 17

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	Issue date	Closing date	color & insert closing date
	March 18	March 6	February 27
	March 25	March 13	March 6
	April 1	March 20	March 13
	April 8	March 27	March 30
	April 15	April 3	March 27
	April 22	April 10	April 3
SJCC Preview	April 29	April 17	April 10
SJCC Show	May 6	April 24	April 17

Let this be your biggest Joint yet.



## H-P Opens Regional Data Centers

PALO ALTO, Calif. — Hewlett-Packard Co., manufacturer of small digital computers, is now supplying before-and-after-sales support to its computer system customers through seven regional data centers, four in the U.S. and three in Europe. The centers are located at Paramus, N.J.; Fullerton, Calif.; Atlanta, Ga.; Skokie, Ill.; Slough, England; Milan, Italy; and Geneva, Switzerland.

Hewlett-Packard is also a large instrument manufacturer, and produces a wide range of computerized data acquisition and instrumentation systems for electronic, microwave, medical, analytical, and acoustical uses.

The company also makes edu-

cational and time-sharing computer systems.

Customers in all these fields are to get their training and software support through the data centers, with backup support available from the factory.

The markets served by H-P are those for small-scale scientific and industrial computers, instrumentation systems, data acquisition systems, time-sharing systems, and educational computer systems.

Before the data centers were established, H-P provided customer support through its area sales offices. Such support will continue, according to a company spokesman. However, the regional data centers will have much more equipment and a broader range of professional skills than is possible in an area sales office.

### Direct Access Computing Opens Commercial Center

SOUTHFIELD, Mich. — Direct Access Computing Corp., a time-sharing, computer services and software firm, has moved to a new operations center in Troy, Mich.

The company also has completed installation of its second Burroughs B5500. The new computer is in service at the new center, located at 984 Livernois, Troy.

Corporate and marketing offices will remain at 24175 Northwestern Highway, Southfield.

### Other Expansions

RCA has added an instructional systems group to its Computer Systems Division in a move designed to broaden and strengthen the company's efforts in educational computer systems software products and services.

Varian Data Machines, Irvine, Calif., has opened a new computer training and service center on the East Coast. The new location is in Cheverly, Md. Varian manufactures small computers and data communications systems.

Courier Terminal Systems, Inc., a company that makes complete remote terminal systems for time-sharing and on-line computer users, has opened offices at 865 Busse Highway, Park Ridge, Ill.

Tymshare, Inc., Palo Alto, Calif., has formed a new international development group which will be responsible for extension of the company's time-sharing business and services outside the U.S. Cegos/Tymshare of Paris is the result of Tymshare's joint venture with two French enterprises, Cegos Informatique, a management consulting firm, and Credit Lyonnaise, a major French bank.

Data Network Corp., New York, a computer service organization, has opened a new office in Hicksville, N.Y., to serve the Long Island business community. Located at 127 N. Broadway, the office will house a marketing, technical, and clerical staff and will contain facilities for interconnection with the company's IBM 360/67 and GE 400 computers in New York City.

Data General Corp., Southboro, Mass., manufacturer of the Nova and Supernova minicomputers, plans to develop a printed circuit board facility in Hudson, Mass.

## Director Recap

Frank H. Brenton has been elected to the board of directors of Group 128, Inc., Waltham, Mass. He is senior vice-president, treasurer, and director of Mammoth Mart, a chain of self-service department stores in New England, Maryland, and North Carolina. He is also a trustee of the Massachusetts Merchandising Retail Foundation.

IBM has elected John N. Irwin II and Gilbert E. Jones to its board of directors. Irwin is a partner in the New York law firm of Patterson, Belknap & Webb and director of IBM World Trade Corp. Jones is a senior vice-president and chairman of IBM's management committee.

Louis E. Buschner, assistant vice-president of Modern Data Techniques, Inc., Denville, N.J.,

in charge of the company's data processing activities, has been elected to the board of directors.

Robert G. Sims has been elected a director of Microdata Corp., Santa Ana, Calif. He is presently managing partner of The Cypress Investment Co. of Los Angeles and New York, and a member of the board of directors of Computing and Software Inc. of Los Angeles.

Typagraph Corp., San Diego, Calif., has appointed Robert Fagley to its board of directors. Fagley is vice-president, technology, of Boothe Computer Corp.

Peter A. van de Paverd, a New York investment counselor, has been elected to the board of directors of General Computer

Systems, Inc., Dallas. He is executive vice-president of Equity Interest, Inc. of New York.

Eclectic Computer Corp. of Dallas has elected three new members to its board of directors. They are: Gordon Gibbs, president of General Computer Systems, Inc. of Dallas; Melvin Goldstein, president of Technical Associates of New Orleans, Inc.; and Lloyd Oatis, a Dallas investor.

Data Automation Co., Inc., Dallas, has named three new members to its board of directors: John P. Brogan, president of Brogan and Associates, New York; Tod R. Collett, DAC executive vice-president of marketing; and Donald E. McArthur, president of Flight Plan, Inc., a subsidiary of DAC.

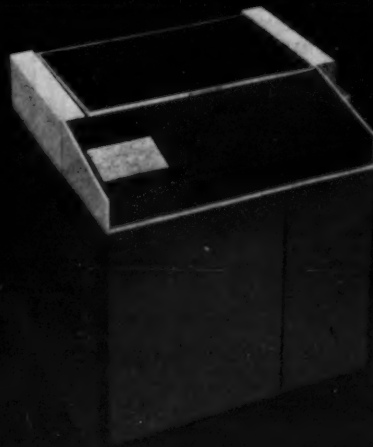
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MELLONICS SYSTEMS DEVELOPMENT DIVISION  
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## Miller Made V.P. of CDC P.O. Division

WASHINGTON, D.C. — Robert E. Miller has been appointed vice-president of Control Data's Post Office Systems Division, located here.

Control Data's Post Office Systems Division is presently working with the U.S. Post Office Department to complete installation of the world's largest computerized data collection

and communication system. Over 12,000 pieces of equipment, 70,000 miles of communications and 250,000 postal employees are involved.

For the past 16 years Miller was with the Melpar Division of American Standard, Inc. There he served as senior vice-president responsible for electronics research, engineering, manufacturing, and quality control.

Prior to joining Melpar, he was chief of the Radio Equipment Division in an agency of the Department of Defense. He also held various engineering manage-

ment positions in the Naval Communications Station, Engineering Research Associates, Inc. and Air Track Manufacturing Co.

A senior member of the I.E.E.E., Miller is also a member of the Armed Forces Communications and Electronics Association, the Washington Society of Engineers and Sigma Tau. He has served as an electronics consultant to the Department of Defense since 1954 and holds patents for a range and direction finder and an automatic communication system.

Miller received his education at the Pennsylvania State College, U.S. Naval Midshipman's School at Northwestern University, and George Washington University.

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See Victor Terminal  
Computer on pages 13, 14, 15

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## EDPeople

## Fabri-Tec Names Morris V.P. and General Manager

MINNEAPOLIS — Robert W. Morris, with 10 years of sales and marketing experience with Honeywell, Inc., has been named vice-president and general manager of Fabri-Tec Information Management, Inc.

Fabri-Tec Information Management, Inc. provides data processing services in such areas as inventory control, payroll handling, parts ordering, plant

production scheduling, bookkeeping, engineering services, and others.

Morris is a graduate of Dartmouth and received his master's degree in business administration from Northwestern University.

He joined Honeywell in 1959 as a coordinator in the production control department. He subsequently was promoted to market manager assistant, Residential Division in 1964. In 1965, he was transferred to Chicago as a sales representative.

In 1966, he was named to the sales force in the EDP Computer Division in Chicago.

There he implemented a national on-line computer order processing and communications system which is currently handling orders for medical equipment and supplies.

## Brandon Appoints A. Ficarra V.P. Of Operations

DALLAS, Texas, — Ennis Brandon Computer Services, Inc., has appointed Anthony M. Ficarra vice-president, operations, for the Dallas-based computer services company.

Ficarra joined Ennis Brandon in 1969 as director of technical services. He was formerly a senior consultant with Brandon Applied Systems in New York. Prior to that he was with Thiokol Chemical Corp.

The company has purchased the M-H-S Building in St. Louis, Missouri. Located at 5865 Hampton Ave., the building houses the company's St. Louis operations.

Ennis Brandon also operates offices in El Paso, Texas, and Toledo, Ohio.

## Mitchell Responsible for Quality Assurance as V.P. for Datagraphix

SAN DIEGO, Calif. — Donald A. Mitchell has been promoted to the position of executive vice-president for Stromberg Datagraphix, Inc., a wholly owned subsidiary of General Dynamics.

In this new position, he will be responsible for the operations of quality assurance, product management, product service, and engineering.

The appointment is intended to provide a focal point for all matters relating to design, development, manufacture, quality, and service of Datagraphix products.

Mitchell transferred to Datagraphix as vice-president in March, 1969, from General Dynamics where he was director of electronic program development.

Beginning his professional career with Westinghouse Electric as a design and development engineer, Mitchell then spent 10 years with Raytheon Co., Lexington, Mass., where he advanced to assistant general manager for Raytheon Service Co.

Mitchell holds a B.S. in mechanical engineering from the University of Maine, and a M.B.A. from Harvard.

## Advanced Computer Names Sobelman And Po Chiu Mar Vice-Presidents

NEW YORK — Advanced Computer Techniques Corp., has named Harvey Sobelman, and Po Chiu Mar as vice-presidents.

Sobelman graduated from Harvard University in 1960 with a Ph.D. in linguistics. He is a member of the Association for Computation Linguistics and the Linguistic Society of America.

Po Chiu Mar graduated from MIT in 1965 with M.S. and B.S. degrees in industrial management. He is the chairman of the

Educational Seminars Committee of the MIT Alumni Center.

Advanced Computer Techniques Corp. provides management, product planning, and product implementation services in the computer field.

These services include feasibility studies, problem analyses, systems analysis/programming, project management, documentation, education, and consultation in computer-based research, design and development.

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## Bulver Heads CDC D.C.-Area Operations

WASHINGTON, D.C. — Control Data Corp. has promoted Paul J. Bulver to the position of vice-president, Washington area operations.

In his new position, Bulver will be responsible for the company's Rabinow operations, located in Rockville, Md., and for Control Data's capital plant at 1228 First St., N.E., here.

In 1960, Bulver joined Control Data as director of an engineering project organized to design and develop a magnetic tape handler for the company's computer systems. Called the CDC 606 magnetic tape handler, this was the first major peripheral product to be produced by Control Data and was the forerunner of its product family of magnetic tape handlers.

Bulver was made director of engineering for Control Data's Peripheral Equipment Division upon its formation in 1961. Under his direction, major programs were launched to design and develop a broad range of peripheral products that included a high-speed card reader, large capacity disk file, disk storage drive, magnetic drum and a line printer.

In 1967, Bulver was made general manager of Control Data's Rabinow operation and served in that capacity until his promotion.

The Rabinow operation produces a line of optical reading systems that includes the 915 OCR page reader, 935 OCR document reader and a large-scale, multiform reading system.

### TUCC Appoints Williams President & Director

RESEARCH TRIANGLE PARK, N.C. — Triangle Universities computation center (TUCC) has appointed Dr. Leland H. Williams to the position of president and director. He will assume his duties at TUCC on June 1.

Since 1966 Williams has been director of the computer center and associate professor of mathematics at Auburn University in Alabama.

He received his Ph.D. in applied mathematics from Duke University in 1961 and served as assistant professor of mathematics and research associate in numerical analysis at Duke from 1960-1962. Before going to Auburn, he was for four years assistant director of the computer center and assistant professor of mathematics at Florida State University.

The Triangle Universities computation center is a computer facility owned and operated by Duke University in Durham, North Carolina State University at Raleigh, and the University of North Carolina at Chapel Hill.

TUCC supports the educational, research, and administrative computing activities of the Triangle universities and other colleges and universities throughout North Carolina through the use of high-speed communications connecting campus terminals and computers in the Research Triangle Park.

### Other Moves

■ Samuel Nooger has been appointed vice-president of operations at Com-Comp, Inc., Long Island, N.Y.

■ Richard M. Bianculli has

joined Data Decisions Corp., New York, as vice-president, communications systems. In his new assignment, Bianculli will direct the communications-oriented activities of Data Decisions which will include the sale of total computer systems as well as consulting services in the design and implementation of communications systems.

■ Com-Step, Inc., New York, a subsidiary of Grey Advertising Inc., has named Philip A. Branch president of the Marketing Division and Marvin Katzman president of the Systems and Operations Division.

■ Fred A. Ordemann Jr., has been elected vice-president/systems of Advanced Memory Systems, Inc., Sunnyvale, Calif. In his position, Ordemann will be responsible for hardware and

software development of a major segment of the AMS product line.

■ Dataflo Business Machines Corp., El Segundo, Calif., has appointed Charles W. Bozarth executive vice-president. He will be responsible for all areas of marketing, including product line management and planning, field sales, and systems analyst training.

■ Philip H. DePasquale, has been appointed corporate vice-president for Cantor Associates of Greenwich, Conn. He will maintain offices in the northeast regional facility of the company in Lexington, Mass.

■ Julius Richman has been named vice-president and director of marketing for Electronic Laboratories, Inc. in Houston.

## Executive Corner

### Logic Corp. Names Mobach VP and General Manager, AI/COM Services

PRINCETON, N.J. — Applied Logic Corp. has promoted Martin T. Mobach to executive vice-president and general manager of AI/Com Services. He moves up from the position of vice-president and director of marketing.

In his new post, Mobach will direct both Operating and Marketing Divisions of the company.

Also appointed were two new vice-presidents: Adolph Futterweit, vice-president, development, and Larry G. Settle, vice-president, operations.

Futterweit was promoted from

manager of product engineering and will direct development of all equipment and software.

Settle formerly was manager, communications, and will be responsible for directing the operations of AI/Com time-sharing systems and services.

Applied Logic Corp. distributes its interactive computer time-sharing service through the nationwide AI/Com network to customers who have direct access via teletypewriters and other terminals to the company's Dual AL-10 computers in Princeton.



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# SRC Subsidiaries Merge to Form Digital Resources Corporation

LOS ANGELES — Digital Resources Corp. will be the name of a new company emerging from the combination of four subsidiaries of Scientific Resources Corp.

The four subsidiaries include Digital Seismic Corp., Houston; Paragon Systems, Inc., Houston; Hybrid Systems, Inc., Houston; and Mauchly-Wood Systems Corp., Newport Beach, Calif.

The new company, which will

be headquartered in Los Angeles, will be organized into three operating divisions. The Computer Equipment Division will manufacture analog/hybrid computer systems and computer peripheral equipment. The Seismic Division will offer complete seismic data processing systems with integrated hardware and software. The Systems Division will be devoted to programming activities in the company's tar-

geted markets — petroleum, aerospace, chemical processing, nuclear power, government, and other specialized areas.

Digital Resources, although self-sustaining, will continue to rely on Scientific Resources for financing of systems leases, and for marketing of those proprietary systems which are outside its main market areas.

A main thrust will be the manufacture and sale of such peripherals as Com-Ex, its computer expander; data couplers; data terminals; and storage and display devices.

## Other New Subsidiaries

★ Listfax Corp. has formed Listfax Computer Services, Inc. in New York.

The new subsidiary will complement and expand the computer communications services already provided by present divisions of Listfax. Listfax Computer Services, Inc. will concentrate its interests in the field of computerized direct mail-marketing services.

★ Dataram Corp., Princeton, N.J., manufacturer of computer memory products and computer test equipment, has established its second controlled off-shore manufacturing subsidiary, Trinidad, Ltd., Port-of-Spain, Trinidad.

Trinidad will provide production capabilities for the assembly and test of memory planes and systems to augment those of the controlled Philippine affiliate, Stanford Associates.

In addition to production facilities, quality control and test departments will be maintained in Trinidad.

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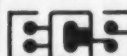
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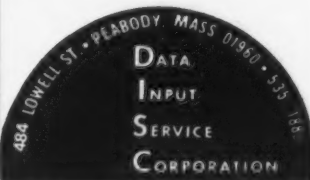
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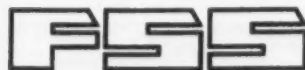
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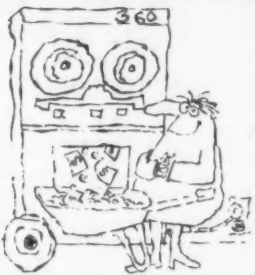


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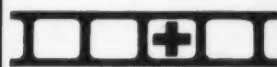
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## Meredith Computerminal V.P., Education Training

SAN FRANCISCO — William F. Meredith has been named vice-president — director of education and training for Computerminal Corp.

In his new position, Meredith will be responsible for training Computerminal salesmen and installation personnel in all aspects of the firm's new remote batch terminal system. He will also prepare training manuals and conduct educational programs as required for the employees of users of the new system.

Previous to joining Computerminal, Meredith was San Francisco branch manager for Univac's Information Services Division.

### Executive Corner

Until 1966 he directed, designed, and implemented data processing systems for a variety of firms in the Bay Area, including electronics manufacturers, steamship agencies, and companies involved with auto leasing, mortgage loans and publishing; as well as for CPAs and management consulting groups.

In 1958, Meredith was appointed assistant production manager for the new data processing department at Ampex Corp. in Redwood City.

Earlier, he was employed by Service Bureau Corp. in San Jose, where he received his initial EDP training.

#### Other Moves

■ Joseph W. Larimore Jr. has been elected a vice-president of Systems Science Development Corp., Richmond Heights, Mo. He will continue to serve as manager of the midwest region of Systems Science, with headquarters in St. Louis, Mo.

■ Harold Madden has been appointed vice-president, operations of the Greeley, Colo., plant of Intercontinental Systems Inc., Palo Alto, Calif.

■ Corles M. Perkins has been named executive vice-president and general manager of Colorado Instruments, Inc., Broomfield, Colo. He has also been elected to the company's board of directors. The company has also appointed John G. Zish as vice-president of marketing.

■ Elgin National Data Services, Inc. of New York has named Frank F. Schmeier president. The company has also made the following appointments: Nicholas Petrillo to vice-president, systems development; Henry Stennes to vice-president, computer services; and Stanley Zirlin to vice-president, systems programming.

■ Nu-Concept Computer Co., Norristown, Pa., has appointed Richard L. Longcoy vice-president and program coordinator.

■ F. Robert Petricone has been elected a vice-president of Torin Corp., Torrington, Conn. He continues as general manager of Torin's Western Division in Van Nuys, Calif.

■ Robert B. Williams has been appointed sales representative in the Philadelphia area for Logic Corp., Haddonfield, N.J.

■ Richard W. Cybulski has been named regional marketing manager in the Computer Products Division of Intercomp of Cambridge, Mass.

■ Tymshare, Inc., Los Angeles, has named Max Beere director of telecommunications systems. He will be responsible for the establishment of Tymshare's new, national telecommunications network for time-sharing.

■ Anthony A. Barnett has been named executive vice-president of the Bunker-Ramo Corp.'s Business & Industry Division, Stamford, Conn. Guy Mallery has been appointed vice-president, marketing.

■ Greyhound Computer Corp. of Chicago has elected Richard C. Stephan vice-president and comptroller.

■ Telecomputations, Inc., Silver Spring, Md., has elected John J. Jordan to the position of vice-president and technical director.

■ James H. Bonnett has been appointed managing director for IDC Europa Ltd., London, a recently formed subsidiary of International Data Corp., Newtonville, Mass. He will be responsible for all operations of the new firm which provides international market information on the computer industry to executives and market and financial analysts overseas.

■ Gary B. Friedman has been elected executive vice-president of ITEL Corp., San Francisco.

#### Now Close Is 1984?

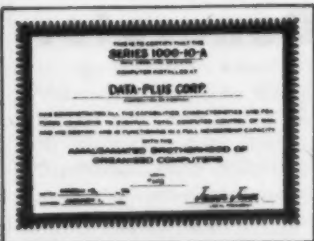
#### WILL THE COMPUTER EVENTUALLY RULE MAN?

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## New Registrations

ASSOCIATED COMPUTER SERVICES, INC., 6420 Hillcroft, Houston, Texas 77036, a company engaged in the business of designing and developing computer programs and providing other related services for users of computer equipment, filed to register 150,000 shares of common stock. Proceeds, at \$4 per share maximum, intended for addition to the company's general funds and for general corporate purposes. The underwriter is Institutional Equity Corp., Houston National Gas Bldg., Houston, Texas 77002.

ECC CORP., 110 Pamela Drive, Euless, Texas 76039, a company engaged in the business of design, development, manufacture, and sale of solid state power control components and modules used in dimmers for incandescent lights and in controls for hand tools, office copiers, and other business machines, air conditioning, and heating systems, appliances, computers, and other equipment requiring the control of electric power, filed to register 180,000 shares of common stock. Proceeds, at \$7.50 per share maximum, intended for the retirement of short-term loans from certain shareholders and short-term bank loans. The underwriter is Robert W. Baird & Co., Inc., 731 N. Water St., Milwaukee, Wis.

ELDORADO ELECTRODATA CORP., 601 Chalamar Road, Concord, Calif. 94520, a company that manufactures and sells digital instruments which are utilized for various frequency, time, and other measuring processes by private and governmental customers, and that has developed and is marketing a data terminal system which employs a magnetic tape cassette for time-sharing users and a small office computer system primarily for accounting, inventory control, automatic typing, and general data processing, filed to register 180,000 shares of common stock. Proceeds, at \$11 per share maximum, intended for the retirement of a short-term bank loan; for working capital; and for carrying increased receivables and inventories. The underwriter is Morgan, Olmstead, Kennedy & Gardner, Inc., 606 S. Olive St., Los Angeles, Calif.

COM COMP, INC., 1324 Motor Pkwy., Hauppauge, Long Island, N.Y. 11787, a company that develops and sells complete computer systems, filed to register 200,000 shares of common stock. Proceeds, at \$10 per share, intended for additional research and development of interfaces for its Com Comp I; for establishing and maintaining a marketing and service organization; for additional plant space and production equipment; for additional technical and production personnel; for additional research and development in connection with new products; for inventory, accounts receivable financing, and for general corporate purposes. No underwriter is involved.

RESPONSIVE DATA PROCESSING CORP., Mt. Kisco, N.Y. 10549, a company engaged in the development of on-line computer services and related proprietary software packages for the health care industries, filed to register 200,000 shares of common stock and warrants to purchase 100,000 shares. Proceeds, at \$20 per unit maximum, intended for the development of proprietary software packages in the medical systems; for marketing of services in the medical systems field; for the retirement of indebtedness incurred for working capital purposes; for addition to the general funds of the company. The underwriters are Pressman, Frohlich & Frost, Inc., 140 Broadway, New York, N.Y., and Hugh Johnson & Co., Inc., 1800 Rand Bldg., 14 Lafayette St., Buffalo, N.Y.

INCOM, INC., 111 High Ridge Road, Stamford, Conn., a company engaged in the design, development and marketing of computer programs to be used primarily by life insurance agents, filed to register 220,000 shares of common stock. Proceeds, at \$5 per share, intended for payment of accounts payable and accrued liabilities; for further research and development; for promotion and marketing of the company's real estate matching service; and for general corporate purposes. No underwriter is involved.

COMPUTER SOLUTIONS, INC., 50 Washington Terrace, E. Orange, N.J. 07017, a company engaged in offering the use of computer systems on a time-sharing basis through local and long-distance telephone facilities, filed to register 150,000 shares of common stock. Proceeds, at \$10 per share maximum, intended for repayment of promissory notes due to shareholders; for the installation and startup expenses of time-sharing

systems and service centers to be established in major metropolitan areas over a two-year period; for the development and implementation of programs and systems; for improvements in the company's time-sharing and peripheral computer equipment line; for the purchase of peripheral computer equipment; and for working capital. The underwriter is Pressman, Frohlich & Frost, Inc., 140 Broadway, New York, N.Y.

COMPUTERIZED STUDENT SEARCH, INC., 414 Hungerford Drive, Rockville, Md. 20850, a company that locates summer employment for students with the aid of a computer, filed to register 100,000 shares of Class A voting common stock, and 100,000 shares of Class B nonvoting common stock. Proceeds, at \$6 per unit, intended for organization of a sales force; for advertising and promotion; for lease of computer time and keypunching, and for general working capital. The underwriters are Norbert Associates, Inc., 333 E. 204th St., Bronx, N.Y., and Davis Securities Co., Inc., 50 Broadway, New York, N.Y.

OPERATIONS ANALYSIS, INC., Melrose Bldg., Houston, Texas 77002, a company engaged in the operation of a full line computer service and data conversion facility, filed to register 100,000 shares of common stock. Proceeds, at \$7.50 per share maximum, intended for establishing its bank data processing capability, including cost of additional facilities, new hardware, and software to support such operation; for acquisition of additional equipment (by purchase or lease); for development and/or acquisition of additional computer programs and packages; for working capital and general corporate purposes. The underwriter is S.J. Salmon & Co., Inc., 100 Maiden Lane, New York, N.Y.

HARASON ENTERPRISES, LTD., 55 Morris Ave., Springfield, N.J. 07081, a company engaged in the business of medical products and services, filed to register 200,000 shares of common stock. Proceeds, at \$3 per share, intended for promotion of Cytec Sputum Cytology Kit and computerized electrocardiograms; for acquisition or opening of full service, professional type pharmacies; for leasing of medical equipment to dealers and private patients, and for working capital. No underwriter is involved.

PHASE SIX DATA CENTERS, INC., 1776 Broadway, New York, N.Y. 10019, a company engaged in computer programming, data processing, and related services, filed to register 150,000 shares of common stock. Proceeds, at \$2.50 per share, intended for working capital and general corporate purposes. The underwriter is M.R. Safir & Co., Inc.

MEDICAL SYSTEMS, INC., 312 E. Wisconsin Ave., Milwaukee, Wis. 53202, a company engaged in the business of assisting in billing and related services for physicians, dentists, clinics, and similar medical practitioners; of technical consulting for medical institutions through the use of data processing and computerized systems, and of the development of personal medical records, filed to register 100,000 shares of common stock. Proceeds, at \$10 per share, intended for further development and marketing of its medical practitioner services; for expanding its staff of technical personnel; for leasing an IBM 360 series computer; for leasing and equipping of office and operational facilities; for administrative expenses and supplies, and for general corporate purposes. The underwriter is the B.F. Seligmann Co., Inc., 110 E. Wisconsin Ave., Milwaukee, Wis. 53202.

EXTEK MICROSYSTEMS, INC., 15424 Cabrito Road, Van Nuys, Calif. 91406, a company that develops, manufactures, and sells printers for the purpose of duplicating microfilm, including principally the duplication of computer output microfilm, filed to register 300,000 shares of common stock. Proceeds, at \$12 per share maximum, intended for use towards completion, manufacturing startup, advertising, and promotion of the company's diazo film duplicating printer under development; for research and development of a microfilm storage and retrieval system; for the development of additional duplicating printers for use with vesicular film (heat developed film) as well as for use with experimental duplicating films; for the purchase of equipment and fixtures to expand plant and offices; for working capital and general corporate purposes. The underwriter is Bosworth, Sullivan & Co., Inc., 660 - 17th St., Denver, Colo. 80202.

LOGIC CORP., 21 Olney Ave., Cherry Hill Industrial Park, Cherry Hill, N.J. 08034, a company that develops and manufactures computer peripheral equipment, principally in the LC-720 computer data entry system, filed to register 500,000 shares of capital stock. Proceeds, at \$15 per share maximum, intended to establish eight new sales and service offices in the U.S. and two in Europe; to recruit and train 70 new sales, service and related clerical personnel; to construct a prototype of a billing and invoicing system and to develop software therefor; to construct a prototype of an inventory system and develop software therefor; to design new terminals, equipment and software for the LC-720 system; to build a laser-based mass storage computer memory system; to finance purchase of certain automated production machinery; to finance an adequate inventory for maintenance of an acceptable delivery schedule; to finance the direct lease of its systems to certain potential customers; to be added to working capital and to be used for general corporate purposes. The underwriter is Mason & Co., Inc., 1100 17th St., N.W., Washington, D.C. 20036.

NCS FRANCHISING CORP., 440 Park Ave. S., New York, N.Y. 10016, a company engaged in the business of franchising certain computer systems offered by National Computer Services Corp., filed to register 125,000 shares of common stock. Proceeds, at \$4 per share, intended for working capital and general corporate purposes. The underwriters are S.M. Securities Corp., 242 E. Beach St., Long Beach, N.Y., and Lancaster Stevens & Co., Inc., 11 W. 42nd St., New York, N.Y.

HOUSTON SCIENCE AND MEDICAL CORP., 7120 Harwin Drive, Houston, Texas 77036, a company engaged, through subsidiaries, in the design, manufacture, and sale of a line of computer-communication remote data terminals and other computer data acquisition systems; in the design, manufacture, sale, and service of medical electronic products for use in mass patient screening and diagnostic applications; and in the marketing of specialized computer business services, data processing and facilities management, filed to register 210,000 shares of common stock and 210,000 common stock purchase warrants. Proceeds, at \$5 per unit, intended for repayment of short-term bank borrowings; for repayment of indebtedness to a principal stockholder; for purchase of inventory and for implementing increased production of existing products; for working capital and general corporate purposes. The underwriter is Parker, Bishop & Welsh, Inc., 100 Park Ave., Oklahoma City, Okla. 73102.

DATAPoint CORP., 50 E. 52nd St., New York, N.Y. 10017, a company that develops and markets a remote data processing service of standard design for the automobile dealership market through a national franchise system utilizing telephone lines for data communications with a central computer system, filed to register 140,000 shares of common stock. Proceeds, at \$12.50 per share maximum, intended for initial capital for certain licensees; for development and implementation of marketing programs; for the development of new computer services to be offered through licensees, and for working capital. The underwriter is Seiditz and Co., Inc., 350 Park Ave., New York, N.Y.

ITEL CORP., 1 Bush St., San Francisco, Calif. 94104, a company that provides computerized accounting services to other businesses and that purchases computers and related equipment for lease to others, filed to register \$21 million of convertible subordinated debentures, due 1995. Proceeds will be used for financing working capital and a portion of the rental programs for Intercontinental Systems, Inc., a company that ITEL has agreed to acquire which is engaged in designing, developing and manufacturing a line of data handling equipment; for financing new branches and a possible additional operating center for its Data Processing Division; for a subsidiary's financing of a portion of additional purchases of containers and other rental equipment; for product development and initial production facilities and operations for Diablo Systems, Inc., of whose preferred stock the company owns 650,000 shares; for general corporate purposes, including possible acquisitions and acquisition-related activities, and for reduction of bank borrowings of a subsidiary. The underwriter is Glore Forgan Staats Inc., Bank of America Center, San Francisco, Calif. 94104.



March 11, 1970

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## Did I Hear That Name Before?

By Michael Merritt  
CW Staff Writer

KENSINGTON, Md. — Ah, a rose by any other name would still smell like cabbage.

You see, there's a company here named I-Tel, Inc. They make microwave components, and they've been doing so since January, 1962.

And in New York there's a company called Itel Corp., which is in the computer business in a diversified way, doing service bureau work, leasing equipment, tooling up to manufacture peripherals, and in general having nothing to do with microwave components.

Now it seems that I-hyphen-Tel has been bothered by the expropriation of its good name. According to its president, Mrs. Virginia Wainwright, the microwave component maker has been troubled with answering phone calls directed to the EDP company, and confusion between the two companies on supplier and customer lists.

So, on Feb. 13, 1970, I-hyphen-Tel entered suit against I-no hyphen-tel for "unfair competition and trademark infringement."

The computer Itel was formed by the merger of SSI Computer Corp. and Statistics for Management Data Processing Corp. on June 17, 1969, and somehow out of all those syllables they came up with the name Itel for the new company.

The hyphenless company, which is traded on the American Stock Exchange, says that it has never had any trouble with people confusing it with the hyphenated company in any of its offices.

And even though I-Tel was in use seven years before Itel, a company spokesman asserted that the name had been cleared in all states before it was adopted, and that, in that timeless loquution of lawyers, the suit "is without merit and we will take appropriate legal action."

'Tis most confusing.

## Tape Drive Agreement Ends MAI-Potter Dispute

NEW YORK — Potter Instrument Co. Inc. and Management Assistance Inc. have agreed to new terms for the marketing of Potter tape drives by MAI, ending an almost year-old dispute [CW, March 4].

Originally MAI had exclusive rights to market the tape transports, which are plug-to-plug compatible with IBM 360 equipment. Potter then decided to cancel the agreement and begin marketing the units directly. MAI sued and the issue has now been settled by arbitration.

Under the new agreement, Potter and MAI can both market the transports without limitation.

This means, the firms said, that, if a combination of sales of such units to MAI over the next 18 months and sales and leases to other commercial customers reach about \$100 million based on current end-user sales value, MAI will realize a maximum benefit of \$6,250,000. Potter

said that the anticipated after-tax cost to Potter of such a maximum was estimated to be under \$3 million.

Under the settlement Potter will also make periodic payments to MAI based on Potter's future sales or leases of transports to other customers, with a minimum of \$2,160,000 payable by Aug. 31, 1974.

Potter said the anticipated after tax costs of the minimum payment to MAI will be about \$1 million, and such minimum amount will be included in Potter's current financial statement as an extraordinary charge. It is not expected to have an adverse effect on operating revenues, Potter said.

## SDC Shuts Down T/S Operations

SANTA MONICA, Calif. — Systems Development Corp., software and services giant, is leaving the time-sharing business.

SDC announced that it was closing its Falls Church, Va., center "immediately" because of "low likelihood of profitability."

SDC said that there will be some layoffs, but most employees will be relocated within the company.

## Xerox Enters Software Market; Acquires Isaac-Dobbs, L.A. Firm

By Phyllis Huggins  
CW West Coast Bureau

LOS ANGELES — Xerox Corp. will enter the computer services field with the acquisition of Isaac-Dobbs Systems Co., a small Los Angeles consulting and software firm, serving as the nucleus of a new subsidiary currently being formed under the working title of "Xerox Computer Ser-

vices."

The entry of a major corporation such as Xerox into this field will carry an impact for the entire industry.

The new subsidiary will use the Isaac-Dobbs Systems utility billing package and accounting packages now under development for a strictly business-oriented service.

The computer hardware to be used will be the XDS Sigma 7.

The opening of the first center is slated for later this year. This will not only be Xerox's entry into a new field but it will be the first development using the largely scientific XDS computer line for business applications.

Service to the centers will be through terminals located at the customers' sites.

The Sigma 7 is a time-sharing system and the accounting packages being developed will use interactive programming methods, a largely underdeveloped use of time-sharing techniques for the business world.

In this mode, the business man will be able to communicate back and forth with the computer just as the technical man does today with his time-sharing terminal.

IDS has been marketing the utility packages largely through banks and recently won a hotly contested bid for the city of Pasadena's billing work against such strong competitors as Computer Sciences Corp.

The young firm employed 20 people but in the expansion of the new Xerox subsidiary, it has already grown to more than 40.

Formed just a few years ago, IDS was first acquired by AIM Companies, a corporation that deals primarily in the machine tool business.

## IBM's Suit Against Cogar Resolved Out-of-Court

NEW YORK — Cogar Corp. and IBM have reached an out-of-court settlement of the lawsuit IBM initiated last July [CW, July 30, 1969] against Cogar and its employees.

The suit, which charged Cogar and 67 of its employees with use of IBM trade secrets, had been filed in the New York Supreme Court in White Plains. The settlement, which was signed by Cogar without any admission of the allegations, provides "effective assurance that IBM's proprietary rights in its developments are fully protected," a joint statement by the firms said.

At the same time, the firms announced that they have signed a patent cross-licensing agreement.

Neither company would reveal which patents were covered by the cross-licensing agreement, or even say if it only covers present patents or not.

The suit originally involved Cogar's plans to sell monolithic semiconductor memory devices. IBM charged that Cogar used IBM manuals, specifications, and drawings containing trade secrets and that Cogar had solicited contractors who made trade-secret devices for IBM to manufacture them for Cogar.

The 67 Cogar employees named in the suit had all worked for IBM before November, 1968. George Cogar, president of the company bearing his name, charged at the time the suit was filed that IBM was trying "to create and enforce servitude on IBM technical personnel."

## Scan Data Corp. Shakes Up Sales Execs As Losses Double to \$1.84 per Share

NORRISTOWN, Pa. — Reporting a 1969 loss double the loss reported in 1968, Scan Data Corp. has moved to beef up its marketing operation and long range planning functions with two new appointments.

The optical character recognition equipment manufacturer announced last week a loss of \$1.4 million or \$1.84 per share on revenues of \$1.3 million for the 1969 fiscal year, ended Dec.

31. In 1968 the firm lost \$720,597 or \$1 per share on sales of \$675,563.

To help cut down future losses and to strengthen its marketing arm, the firm announced the appointment of E.E. Strickland as a director and Robert R. Burns as executive vice president and a director. Strickland previously served as vice president of corporate development at

Control Data Corp. and Burns served as general manager of CDC's data center operation.

Burns will also serve as chief operating officer for the OCR firm and will be responsible for sales, maintenance, service center operation, and product planning, Scan Data said.

In line with the new emphasis on marketing, the firm also announced that it would market its recently-introduced Model 200 reader as a single font machine. Until now, Scan Data has been one of the industry's main proponents of multifont readers.

The 200, Scan Data said, will be marketed as an OCR-A reader. It can still handle up to five separate fonts, the firm added, and can be upgraded in the field to handle four other fonts.

Other members of the Scan Data line — the Model 110-A three font machine and the Model 500, a multifont machine of almost unlimited font capability — will continue to be marketed in their multifont versions only.

Last May company president Alan I. Frank had predicted his firm would show "profitable operation during the second half and . . . a profit for the year as a whole." This estimate was made on the basis of Scan Data's first move into production.

## Applied Data Research Net Drops 70%; Firm Blames Writeoffs, Start-Up Costs

PRINCETON, N.J. — Applied Data Research, Inc., computer software and service company, reported record operating revenues for the year ended Dec. 31, 1969.

Revenues for 1969 were \$6,151,405 compared with \$4,775,230 for 1968. Net earnings, however, declined to \$104,139 or 11 cents a share. This compares with net earnings of \$352,849 or 39 cents a share in 1968.

Earnings during 1969 have been adjusted to reflect the extraordinary deduction of \$45,510 or 5 cents a share attributable to an airplane crash in November at its Princeton executive offices.

Figures for both years have also been adjusted to reflect the August 1969 acquisition of Programatics, Inc. The effect of this acquisition has reduced 1969 earnings by 16 cents a share and 1968 earnings by 22 cents a share.

The 29% increase in operating revenues, Richard C. Jones, president, said, resulted from increases in the sale of proprietary software products and new and renewed systems and programming contracts.

Decrease in earnings, though, were caused by a number of factors, he said, including writeoffs from the Princeton fire, investment in the development of new proprietary products, the opening and staffing of additional sales offices, a significant increase in the technical staff, and the Programatics acquisition.

Despite adverse conditions last year, the company did produce record sales of Autoflow, a proprietary software product. Revenues from Autoflow alone were over \$2.8 million.

In addition, Jones said, Applied Data Research introduced new proprietary software products during late 1969 which should prove beneficial to the company during the present year.



# CSC Expands Operations to Australia, South Africa

CENTURY CITY, Calif. — Computer Sciences Corp. has joined two leading international organizations in Australia and South Africa to provide computer time-sharing and technical services in those and adjacent countries.

The company's partners in the two joint ventures are the Aus-

tralian Mutual Provident Society and the Anglo-American Corporation of South Africa Ltd.

Both of CSC's partners are leaders in their respective fields, CSC President William R. Hoover noted. Australian Mutual Provident (AMP) is the largest life insurance underwriter in the southern hemisphere, with

assets approaching \$2.5 billion.

AMP provides fire and general insurance services in Australia and New Zealand and has extensive interests in finance and industrial development.

The Anglo-American group of companies is the world's largest mining organization. The group also has worldwide interests in

manufacturing, finance, transportation, land development, and other industries.

The two companies to be formed by the joint ventures will be known as Computer Sciences Australia, Ltd., with headquarters in Sydney, and Computer Sciences South Africa, Ltd., to be based in Johannes-

burg.

"CSC's decision to enter the Australian and South African markets was based on two highly favorable factors," Hoover said. "First, both of these areas are emerging as major computer users due to their concerted efforts in the expansion of their industrial base."

"In addition," he stated, "we have allied ourselves with organizations which are among the most progressive and prominent in each country, thus providing us with exceptionally favorable opportunities for rapid, large-scale penetration of the market."

CSC will hold 49% ownership of the companies to be formed in Australia and South Africa, according to Hoover.

Each of the new companies will establish a computer-based information network which will provide CSC's Infonet services to business and governmental organizations throughout the countries in which the companies will operate.

Central computers installed in major cities will be linked by telephone circuits to remote terminal units located at subscribers' own facilities, enabling subscribers to solve problems and process data on the computer without leaving their own offices.

The companies will also provide organizations having their own computers with systems analysis, programming, and all of the related technical services essential to the development of information systems, according to Hoover.

Still other activities include the marketing of CSC's applications packages.

## Earnings Reports

### CALIFORNIA COMPUTER PROD.

	1970	a1969
Shr Ernd	\$1.0	\$2.2
Revenue	10,357,880	9,511,404
Earnings	231,883	495,544

a-Restated to reflect an acquisition on a pooling-of-interests basis.

### LUNDY ELECTRONICS & SYS.

	1969	1968
aShr Ernd	\$0.2	\$1.9
Revenue	7,874,907	7,464,503
Tax Cred	10,762	5,266
bEarnings	26,157	173,933

a-Based on income before tax credits; b-Equal to three cents a share in 1969 and 20 cents a share in 1968.

### COMPUTER APPLICATIONS INC.

	1969	a1968
Shr Ernd	.....	b\$.37
cRevenue	\$41,913,627	38,174,335
Spec Items	d2,778,991	e48,000
Loss	10,076,903	f608,788

a-Includes acquisitions on a pooling-of-interests basis; b-Based on income before special credit; c-Excludes revenues from discontinued operations; d-Debit; consists of excess costs over net assets acquired from discontinued operations amounting to \$1,738,991 and a provision of \$1,040,000 for losses from discontinued operations; e-Credit; f-Equal to 41 cents a share.

### ELECTRONIC ASSOCIATES

	1970	1969
Shr Ernd	.....	\$1.0
Revenue	\$41,223,859	43,917,664
Loss	2,222,076	a245,530

a-Income.

### CINCINNATI MILLING MACHINE

	1969	1968
Shr Ernd	\$4.11	\$4.46
Revenue	293,000,000	281,100,000
Earnings	14,900,000	16,100,000
12 Wk Shr	1.05	1.20
Revenue	75,400,000	74,500,000
Earnings	3,800,000	4,300,000

### LEASCO DATA PROCESSING

	1969	a1968
Shr Ernd	\$6.2	b\$.82
Revenue	130,005,000	113,378,000
Earnings	10,128,000	13,212,000

a-Restated to reflect operations of, and shares issued in exchange for,

### TRILOG ASSOCIATES, INC.

	1969	1968
aShr Ernd	\$2.4	\$4.0
Revenue	1,483,786	621,784
Earnings	25,206	38,373

a-Assuming full dilution.

companies acquired as poolings-of-interests and to reflect the full consolidation of the life insurance subsidiaries which is a change in accounting classification that became effective for the quarter ended Dec. 31, 1969; b-Adjusted for five-for-two stock split in March 1969; c-Includes revenues from Reliance Insurance Co., amounting to \$101,428,000 in 1969 and \$93,468,000 in 1968.

### COMPUTER INVESTORS GROUP

	1969	1968
Shr Ernd	\$1.2	\$0.9
Revenue	2,029,624	1,332,293
Earnings	233,165	163,031
9 Mo Shr	.32	.23
Revenue	5,447,252	3,291,783
Earnings	604,711	394,035

### HUDSON LEASING CORP.

	1969	1968
aShr Ernd	\$3.8	b\$.34
Revenue	5,787,950	3,620,851
Earnings	590,232	355,851
a6 Mo Shr	.79	a.58
Revenue	11,139,982	7,234,688
Earnings	1,215,533	600,477

a-Includes non-recurring gain of nine cents a share from sale of 25% interest in Eurolease S.A.; b-On a primary basis.

### MOORE PRODUCTS CO.

	1969	1968
Shr Ernd	\$6.0	\$5.6
Revenue	13,031,645	11,793,325
Earnings	1,112,397	1,054,602

### MANAGEMENT ASSISTANCE, INC.

	1969	1968
Revenue	\$16,582,000	\$17,558,000
Loss	a1,113,000	317,000

a-Includes recovery of provision for future losses pertaining to IBM manufactured unit-record equipment and computer system domestic marketing operations in the amount of \$750,000.

### AMPEX CORP.

	1970	1969
Shr Ernd	\$3.7	\$3.5
Revenue	80,332,000	74,678,000
Earnings	4,018,000	3,634,000
9Mo Shr	1.06	.97
Revenue	229,601,000	207,554,000
Earnings	11,444,000	9,620,000

### PROGRAMMING & SYSTEMS

	1969	a1968
Shr Ernd	\$1.1	\$0.8
Revenue	3,996,189	3,488,224
Earnings	344,541	247,650

a-Includes acquisitions on a pooling-of-interest basis.

### TALLEY INDUSTRIES INC.

	1969	a1968
bShr Ernd	\$1.44	\$1.33
Revenue	103,901,687	89,811,578
Earnings	c5,626,626	5,174,842

a-Restated to include operations of companies acquired on a pooling-of-interests basis; b-On a primary basis. On a fully diluted basis, per-share earnings were \$1.35 in 1969 and \$1.28 in 1968; c-Includes approximately \$851,000, after taxes, representing a claim against the U.S. Government for additional cost incurred by the company to complete a fixed price contract. Management said it does not consider it necessary to provide for the event that this amount may not be fully collectable.

### URS SYSTEMS CORP.

	1969	a1968
Shr Ernd	\$7.1	b\$.67
Revenue	26,400,000	22,300,000
Earnings	1,396,000	c1,292,000

a-Restated to include results of three acquisitions made during 1969 on a pooling-of-interests basis; b-Based on income before extraordinary gain; c-Equal to 70 cents a share.

### TELECOR INC.

	1969	a1968
bShr Ernd	\$6.0	\$4.6
Revenue	13,377,594	10,756,393
Earnings	595,922	461,254

a-Three months ended Nov. 30; b-Based on 1,000,145 common shares outstanding prior to the public offering, Dec. 2, 1969.

### MITE CORP.

	1969	1968
aShr Ernd	\$1.9	\$1.9
Revenue	10,730,446	8,734,780
Earnings	551,510	416,481

a-Share earnings reflecting all potential distribution would be 18 cents in both years.

### ITEL CORP.

	1969	a1968
Shr Ernd	\$8.6	\$1.7
Revenue	40,437,000	9,761,000
Earnings	3,288,000	488,000
3 Mo		
Shr	\$2.4	\$1.9
Revenue	11,911,000	5,479,000
Earnings	918,000	648,000

a-Restated to reflect the June, 1969, merger of SSI Computer Corp. and Statistics For Management Data Processing Corp. into ITEL Corp.

### BURROUGHS CORP.

	1969	1968
Shr Ernd	\$1.49	a\$1.21
Revenue	242,107,000	205,463,000
Earnings	24,957,000	19,901,000
Year Shr	3.32	a2.64
Revenue	759,336,000	655,560,000
Earnings	55,199,000	43,301,000

a-Adjusted for a two-for-one stock split in March, 1969.

### WORLDWIDE COMPUTER SERVICES INC.

	1969	1968
Shr Ernd	a\$.05	\$0.4
Revenue	126,969	92,570
Earnings	9,804	5,677

a-Based upon 155,000 shares outstanding for the years ended April 30, 1968, and a weighted average of

187,054 shares outstanding for the year ended April 30, 1969.

### BECKMAN INSTRUMENTS INC.

	1969	1968
Shr Ernd	\$3.1	\$2.4
Revenue	33,297,019	32,723,832
Earnings	1,051,535	815,223
6 Mo		
Shr	.56	.44
Revenue	64,937,565	63,149,141
Earnings	1,926,946	1,491,871

### ASTRODATA INC.

	1969	1968
aShr Ernd	.....	\$1.0
Revenue	\$4,108,000	5,820,000
Spec Chg	b450,000	.....
Loss	1,183,000	c151,000
a9 Mo Shr	.28	.....
Revenue	14,772,000	16,163,000
Spec Chg	d1,167,000	.....
Loss	635,000	39,000

a-Based on income before special charge; b-Loss to cover both realized and anticipated costs on the company's advanced computer-controlled communications system; c-Income.

### REDCOR CORP.

	1969	1968
Revenue	\$4,163,200	\$3,284,800
aTax Cred	25,500	26,000
Earnings	107,900	85,100

a-From loss carryforward of Zeitex Inc., a subsidiary.

### XEROX CORP.

	1969	a1968
Shr Ernd	\$2.08	\$1.68
Rev	1,482,895,000	1,224,352,000
Earnings	161,368,000	128,950,000

a-Restated by company; Revenues for both years consolidated for the first time the revenues of Rank Xerox Ltd.; Results of Xerox Data Systems Inc. and Scientific Data Systems when acquired, are also included in Xerox figures for both years.

### COMPUTER SCIENCES CORP.

	1969	1968
Shr Ernd	\$2.1	a\$.14
Revenue	21,937,000	16,608,000
Earnings	2,573,000	1,616,000
b39 Wk		
Shr	.65	a.34
Revenue	62,783,000	48,434,000
Spec Cred	.....	c387,000
Earnings	7,858,000	d4,435,000

a-Adjusted to reflect five-for-two stock split in June 1969; b-Based on income before special credit; c-Gain on sale of securities; d-Equal to 37 cents a share.

### TRW INC.

	1969	1968
bShr Ernd	\$2.36	\$2.13
Rev	1,588,000,000	1,487,547,480
Earnings	78,200,000	72,192,835

a-Preliminary; b-Based on average number of common shares assuming conversion of Series A preference stock and exercise of options. On a fully diluted basis, share earnings, assuming conversion of all convertible securities were \$2.31 in 1969 and \$2.10 in 1968. Net income for 1969 was increased by nine cents a share through a change to the straight-line method of computing depreciation on a major part of assets.

### COMPANIES CONSIDERING:

## PUBLIC OFFERING PRIVATE FINANCE MERGER

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## \$4 Million USTS Sold To Optimum

PALO ALTO, Calif. — Optimum Systems, Inc., a service and software firm, is acquiring U.S. Time Sharing, Inc. for more than \$4 million in stock.

Each share of Washington, D.C.-based U.S. Time Sharing will be converted into 0.5714 shares of Optimum under the plan. Optimum is a privately held company, while USTS is traded over the counter.

Valuing an Optimum share at \$25 for the acquisition, the total purchase price of USTS will be \$4,657,200.

USTS founder and president W. Porter Stone will become executive vice-president of the surviving company, while A. Salam Querishi will remain president and chairman of Optimum.

The acquisition is apparently another move in Optimum's plan to become a nationwide time-sharing, information utility.

USTS was founded in November, 1967, and has been offering time-sharing services in the Washington area.

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## Nickels and Dimes

COMRESS, D.C. based software and consulting company, reported earnings of \$536,000, or eight cents per share on revenues of \$4,979,000 for 1969. '68 figures were earnings of \$236,000, or four cents a share, on a volume of \$3,213,000. Comress markets a line of proprietary hardware and software systems for computer system evaluation.

\$\$\$

Sperry Rand's UNIVAC division is in court seeking an injunction and damages against Univac Computerized Tax Systems, Inc., of Hempstead, N.Y. for trademark infringement. And, no the complaint didn't read "taking the Lord's name in vain."

\$\$\$

TECHNITROL's 1969 sales zoomed up 47% from \$8.9 million to \$13.1 million, and earnings changed from a net loss of \$136,000 to a profit of \$550,000, or 40 cents a share. The company makes computer components and systems, and its president said that while there has been no let up in the industry's price-cost squeeze, Technitrol had been able to streamline operations to get fatter profit margins.

\$\$\$

First quarter at COMPUTING AND SOFTWARE shows net up 31% to 31 cents per share and sales up marginally to \$14.4 million from \$13.5 million, "excluding discontinued operations..." and after restatement for all pooling of interests. For the year earnings were up 52% to \$1.11 per share or \$4.1 million net, on a sales increase of 21% to \$64.4 million.

\$\$\$

A slight rise in sales accompanies an 18.4% drop in earnings at ADDRESSOGRAPH MULTIGRAPH for the second quarter. Per share earnings were 51 cents against 62 cents last year.

\$\$\$

New records at AMPEX. Nine month sales were \$230 million, up 11%, and earnings were \$11.4 million, up 19%. Per share earnings calculate to \$1.06, up 9%. And the backlog was up 20%. The sun shines in Redwood City.

\$\$\$

Minimaker DATA GENERAL had first quarter sales of \$1.1 million and a net of \$88,000, all tax free because of last year's losses. The first quarter sales were higher than all of the previous year, \$1,034,000.

\$\$\$

GRAHAM MAGNETICS' six months reveals sales jumping from \$1.7 million to \$2.3 million and last year's loss of \$12,000 changing to a net profit of \$135,000, or 20 cents a share after including a \$67,000 income tax carry forward. On the balance sheet side, stockholder's equity quadrupled from \$1.2 million to \$4.99 million. Graham was one of the creditors of Scientific Control during its bankruptcy proceeding and should receive about 75,000 shares of SCC in return for its \$1 million debt.

## Computerworld Stock Trading Summary

NEW YORK AND AMERICAN STOCK EXCHANGE CLOSING PRICES, FRIDAY, MARCH 6; OVER THE COUNTER, THURSDAY, MARCH 5

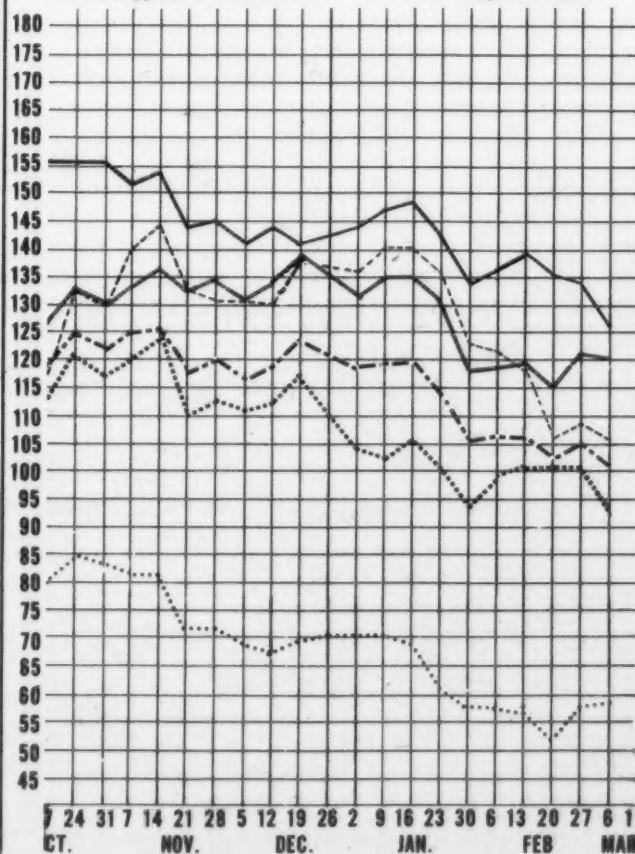
SUPPLIES & ACCESSORIES						COMPUTER SYSTEMS					
EXCH	'69-'70 RANGE	CLOSING PRICE		WEEK NET CHANGE	WEEK % CHANGE	EXCH	'69-'70 RANGE	CLOSING PRICE		WEEK NET CHANGE	WEEK % CHANGE
O	47-31	38 1/4	ACME VISIBLE	- 3/4	- 1.92	N	172-120	145 5/8	BURROUGHS CORP	- 3 1/2	- 2.35
N	22-11	13 1/2	ADAMS-MILLIS CORP	- 1 1/4	- 8.47	N	69-20	23 5/8	COLLINS RADIO	- 1 1/8	- 4.55
O	27-15	17	BALTIMORE BUS FORM	+ 1/2	+ 3.03	N	159-58	63 7/8	CONTROL DATA CORP	- 5/8	- 0.97
A	29-13	15 1/4	BARRY WRIGHT	+ 1/2	+ 3.39	A	124-54	100 1/8	DIGITAL EQUIPMENT	-12 5/8	-11.20
O	44-26	32 5/8	DATA DOCUMENTS	+ 1 1/8	+ 3.57	N	25-7	9 1/2	ELECTRONIC ASSOC.	+ 1 1/2	+18.75
N	19-15	16 3/4	ENNIS BUS. FORMS	- 1	- 5.63	A	28-10	11	ELECTRONIC ENGINEER	- 1 1/8	- 9.28
N	173-65	122 5/8	MEMOREX	-11 1/8	- 8.32	N	45-25	37 1/4	FOXBORO	+ 2 3/4	+ 7.97
N	118-94	106 1/2	3M COMPANY	- 2 1/2	- 2.29	N	98-67	74 3/8	GENERAL ELECTRIC	+ 3 7/8	+ 5.50
O	39-24	37 1/4	MOORE BUS FORMS	+ 1	+ 2.76	N	114-75	94 1/4	HEWLETT-PACKARD CO	- 5 1/2	- 5.51
N	49-36	43	NASHUA CORP.	+ 1	+ 2.38	N	207-57	128 3/4	HONEYWELL INC	-10	- 7.21
O	48-30	46	REYNOLDS & REYNOLD	+ 1	+ 2.22	N	387-291	325 1/4	IBM	-15	- 4.41
O	31-23	29	STANDARD REGISTER	+ 1/2	+ 1.75	N	171-108	136 3/4	NCR	- 9 1/4	- 6.34
N	39-8	36 1/2	UACOR	- 1/2	- 1.35	N	48-29	32 1/8	RCA	+ 2 1/8	+ 7.08
A	30-10	20 5/8	WABASH MAGNETICS	- 2 1/2	-10.81	O	50-26	27 3/4	RAYTHEON CO	- 3/4	- 2.63
O	41-28	41	WALLACE BUS FORMS	+ 2	+ 5.13	N	43-1	5 1/2	SCI. CONTROL CORP.	- 1/2	- 8.33

PERIPHERALS & SUBSYSTEMS						LEASING COMPANIES					
EXCH	'69-'70 RANGE	CLOSING PRICE		WEEK NET CHANGE	WEEK % CHANGE	EXCH	'69-'70 RANGE	CLOSING PRICE		WEEK NET CHANGE	WEEK % CHANGE
N	85-24	46	ADDRESSOGRAPH-MULT	+ 1 3/4	+ 3.95	O	14-6	8 3/4	BANISTER CONTIN	- 1/8	- 1.41
O	71-10	11 1/4	ALPHANUMERIC	- 1 1/8	- 9.09	O	45-20	24 1/2	BOOTH COMPUTER	- 1/2	- 2.00
N	49-32	34 3/8	AMPEX CORP	- 4 1/4	-11.00	O	18-4	6 3/4	COMPUTER EXCHANGE	---	---
A	36-10	10 5/8	ASTRODATA	+ 1/2	+ 4.94	O	34-9	9 1/2	COMPUTER LEASING	- 1	- 9.52
O	19-8	11 1/4	BOLT, BERANEK & NEW	+ 1	+ 9.76	O	15-7	12 3/4	CYBER-TRONICS	---	---
N	17-9	12 7/8	BUNKER-RAMO	- 1/2	- 3.74	A	60-19	24 7/8	DATA PROC. F & G	+ 2 7/8	+13.07
A	37-18	28 5/8	CALCOMP	- 1	- 3.38	O	16-2	5 3/4	DATRONIC RENTAL	- 1/4	- 4.17
O	38-11	11	COGNITRONICS	- 1/4	- 2.22	A	52-18	18 3/4	DEARBORN COMPUTER	- 1 1/8	- 5.66
O	28-8	9 3/4	COLORADO INST.	- 1/2	- 4.88	A	16-6	7 1/8	DPA, INC.	- 1/4	- 3.39
O	48-27	32	COMPUTER COMMUN.	+ 3 1/2	+12.28	A	45-14	15	GRANITE MGT	- 3/8	- 2.44
A	16-7	9	COMPUTER EQUIPMENT	- 1/8	- 1.37	A	28-11	12 1/2	GREYHOUND COMPUTER	- 1/8	- 0.99
A	27-12	18 5/8	DATA PRODUCTS CORP	- 2 7/8	-13.37	N	54-16	20 7/8	LEASCO DATA PROC.	+ 2 1/4	+12.08
O	43-15	23	DATA TECHNOLOGY	+ 1	+ 4.55	O	9-4	4 3/4	LECTRO COMP LEAS	+ 1/8	+ 2.70
O	22-10	10 1/4	DIGITRONICS	- 1 3/4	-14.58	A	57-9	12 1/2	LEVIN-TOWNSEND CMP	+ 3/4	+ 6.38
N	43-28	29 1/4	ELECTRONIC M & M	- 4 1/4	-12.69	O	8-1	2 3/4	LMC DATA, INC.	---	---
O	18-5	6 5/8	FABRI-TEK	- 1/8	- 1.85	O	14-2	3 1/8	MANAGEMENT ASSIST	- 1/8	- 3.85
O	37-13	13 1/2	FARRINGTON MFG	+ 1/8	+ 0.92	O	12-6	8 1/4	NCC LEASING	- 1/4	- 2.94
O	21-10	18 1/4	INFORMATION DIS	+ 1/4	+ 1.39	O	34-3	6 1/4	SYSTEM CAPITAL	+ 1/4	+ 4.17
A	82-13	46 7/8	MARSHALL INDUSTRIES	- 3	- 6.02	A	28-13	17 5/8	U.S. LEASING	- 3/8	- 2.08
A	84-17	68 7/8	HILGO ELECTRONICS	+ 6 1/2	+10.42						
A	89-59	65	MOHAWK DATA SCI.	-11 1/2	-15.03						
O	118-36	36	OPTICAL SCANNING	---	---						
O	31-10	12 1/2	PHOTON	+ 1/2	+ 4.17						
O	15-3	3 7/8	PHOTO-MAGNETIC SYS.	---	---						
A	46-23	39 1/2	POTTER INSTRUMENT	- 2 1/8	- 5.11						
O	42-15	17 1/2	PRECISION INST.	+ 1 3/4	+11.11						
O	82-54	62 1/2	RECOGNITION EQUIP	- 4	- 6.02						
O	36-25	33	REDCOR CORP.	---	---						
N	61-16	18 5/8	SANDERS ASSOCIATES	---	---						
O	85-28	33	SCAN DATA	- 5	-13.16						
O	36-15	22	TALLY CORP.	+ 1/2	+ 2.33						
N	159-20	127 1/2	TELEX	- 7	- 5.20						
O	58-14	31 1/2	VIATRON	- 4	-11.27						

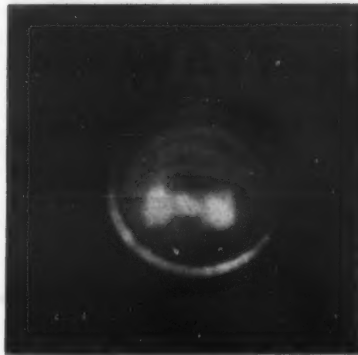
SOFTWARE & EDP SERVICES						LEASING COMPANIES					
EXCH	'69-'70 RANGE	CLOSING PRICE		WEEK NET CHANGE	WEEK % CHANGE	EXCH	'69-'70 RANGE	CLOSING PRICE		WEEK NET CHANGE	WEEK % CHANGE
O	14-4	5 3/4	ADVANCED COMP TECH	+ 1/4	+ 4.55						
A	32-9	10 1/2	APPLIED DATA RES.	- 3/8	- 3.45						
O	19-3	4	ARIES	---	---						
A	47-34	41 1/2	AUTOMATIC DATA PROC	- 5	-10.75						
O	16-7	11 1/4	AUTO SCIENCES	- 1/2	- 4.26						
O	17-5	5 1/2	BRANDON APPL SYS	- 1/4	- 4.35						
O	7-1	1 1/2	COMPUTER AGE INDUS.	- 1/8	- 7.69						
A	21-6	8 3/4	COMPUTER APPL	---	---						
O	16-6	11 1/2	COMPUTER ENVIRON	- 1/2	- 4.17						
O	47-10	11	COMPUTER NETWORK	---	---						
N	34-19	24	COMPUTER SCIENCES	- 5/8	- 2.54						
O	40-5	5 7/8	COMPUTER USAGE	+ 1/8	+ 2.17						
A	75-37	61 3/4	COMPUTING & SOFT	- 2	- 3.14						
O	9-1	2 1/2	CONSOL. ANAL. CENT.	+ 1	+66.67						
O	26-13	19 1/2	DATA AUTOMATION	+ 1/4	+ 1.30						
O	30-17	22 1/2	DATA PACKAGING	+ 1/2	+ 2.27						
O	24-3	4 3/4	DATATION SERVICE	---	---						
O	17-5	6	DATATAB	---	---						
O	15-2	4 1/4	DIGITEK	- 1/4	- 5.56						
O	26-9	9 3/4	EDP RESOURCES	- 1/4	- 2.50						
A	38-7	10 3/8	ELECT COMP PROG	- 1/8	- 1.19						
O	30-12	16	INFORMATICS	+ 2 1/2	+18.52						
A	37-14	16 3/8	ITEL	- 3 1/4	-16.56						
O	21-3	4 1/2	LEVIN-TOWNSEND SERV.	---	---						
A	34-13	24 1/8	MANAGEMENT DATA	- 3/8	- 1.53						
O	22-4	7 1/2	NAT COMP ANALYSTS	+ 1/4	+ 3.45						
A	53-23	45 1/2	PLANNING RESEARCH	- 3	- 6.19						
O	27-13	22 1/2	PROGRAMMING METHODS	---	---						
O	11-3	4 1/2	PROGRAMMING & SYS	- 1/8	- 2.70						
O	37-11	29 3/4	PROGRAMMING SCIENCES	+ 3/4	+ 2.59						
N	35-9	9 5/8	SCIENTIFIC RESOURCES	- 7/8	- 8.33						
O	10-1	2	SOFTWARE SYSTEMS	---	---						
O	37-2	2 7/8	STRATEGIC SYS	+ 1/8	+ 4.55						
O	36-11	19	TBS COMP CENT INC.	- 1	- 5.00						
O	12-3	3 3/4	UNITED DATA CENTER	---	---						
N	155-50	50 7/8	UNIVERSITY COMP.	- 9	-15.03						
O	38-22	23 1/2	URS SYSTEMS	- 1 1/2	- 6.00						
O	16-6	9 1/2	U.S. TIME-SHARING	- 2	-17.39						

## Computer Stocks Trading Index

Computer Systems      Software & EDP Services  
Peripherals & Subsystems      Leasing Companies  
Supplies & Accessories      CW Composite Index



BASE FOR EACH TRADING INDEX: 100 as of 3/1/68



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